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Bibliography on Climate of Australia and New Zealand

. 4 April, 1953 No. 4

# METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

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**METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY** is a monthly publication devoted to:

A. Current Abstracts in English on important meteorological literature in every language.

B. Bibliographic references to other items of interest to the profession.

C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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# METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 4 APRIL, 1953 No. 4

**SPECIAL FEATURE IN THIS ISSUE**

A Selective Annotated Bibliography on the Climate of Australia and New Zealand

(*For complete table of contents see back cover*)

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# FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains from 175 to 300 abstracts of current periodical literature and monographs in the fields of meteorology, hydrology, oceanography, etc. These abstracts are arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of from 50 to 250 important references on a special subject without respect to recency of material. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject. Preference is given to recent material, comprehensive works, material from obscure sources, and items with good bibliographies.

Bibliographies previously published were:

| No. Mo. | Vol. I, 1950 | Vol. II, 1951 | Vol. III, 1952 |
|---|---|---|---|
| 1. Jan. | **Atmospheric Pollution** | **Extended Forecasting** | **Climate—Northwest Africa** |
| 2. Feb. | **Aerobiology** | **Long Range Forecasting** | **Carbon Dioxide** |
| 3. March | **Cloud Physics** | **Soil Temperature** | **Climate—Paraguay, Uruguay, Argentina** |
| 4. April | **Hail** | **Constants, Tables, Diagrams** | **Dew** |
| 5. May | **Tornadoes** | **Climate—Near East** | **Objective Forecasting** |
| 6. June | **Volcanic Dust** | **Climate—Middle East** | **Stratus Forecasting** |
| 7. July | **Climatic Changes** | **Special Winds** | **Urban Climatology** |
| 8. Aug. | **Thunderstorms** | **Radar Storm Detection** | **Climate—Central Africa** |
| 9. Sept. | **Icing** | **Condensation Trails** | **Visibility** |
| 10. Oct. | **Acoustical Propagation** | **Climate—Northeast Africa** | **Glaze and Rime** |
| 11. Nov. | **Evaporation** | **Mountain Meteorology** | **Free Air Turbulence** |

Bibliographies published this year are:

1. **Turbulence Theory,** Vol. IV, No. 1, Jan. 1953
2. **Turbulent Diffusion and Exchange,** Vol. IV, No. 2, Feb. 1953
3. **Frost and Frost Forecasting,** Vol. IV, No. 3, March 1953
4. **Climate of Australia and New Zealand,** Vol. IV, No. 4, April 1953

Forthcoming bibliographies will be:

5. **High Level Winds (500–100 mb),** Vol. IV, No. 5, May 1953
6. **High Level Winds (above 100 mb),** Vol. IV, No. 6, June 1953
7. **Jet Stream,** Vol. IV, No. 7, July 1953

Other bibliographies in preparation are:

*Actinometers*
*Arctic Meteorology*
*Auroral Physics*
*Climate of Southeast Asia and the East Indies*
*Climate of the Pacific Ocean Area*
*Machine Methods in Meteorology*
*Microwave Propagation*
*Oceanographic Meteorology*
*Ozone*
*Radiation Bioclimatology*
*Sferics*
*Snow Cover*
*Tropical Cyclones*
*Tropopause Variations*

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the December issue cumulative author, subject, geographical and journal indexes are published.

# EXPLANATIONS

**Location of material:** For each entry, a symbol is given for at least one library where th material may be found. The Union List of Serials (Gregory) is the source of most of th symbols used. In some cases, where no symbol has been assigned to a library, one will b devised according to the principles of the Union List.

**Library symbols** used frequently may be found in the following list:

| | |
|---|---|
| **DA:** | U. S. Dept. of Agriculture Library, Washington, D. C. |
| **DBS:** | U. S. Bureau of Standards Library, Washington, D. C. |
| **DGS:** | U. S. Geological Survey Library, Washington, D. C. |
| **DLC:** | Library of Congress, Washington, D. C. |
| **DSG:** | U. S. Army Medical Library, Washington, D. C. |
| **DSI:** | Smithsonian Institution Library, Washington, D. C. |
| **DWB:** | U. S. Weather Bureau Library, Washington, D. C. |
| **GB-MO:** | Great Britain, Meteorological Office Library, Harrow, England. |
| **MH-BH:** | Harvard University, Blue Hill Observatory (and American Meteorologica Society) Library, Milton, Mass. |
| **NN:** | New York Public Library, New York, N. Y. |
| **NNA:** | American Geographical Society Library, New York, N. Y. |

**Other symbols:**

| | |
|---|---|
| * | before an entry indicates a good data source. |
| † | before an entry indicates a good bibliography. |
| § | before an entry indicates a synoptic case history study accompanied by charts |

**Geographic locations** are in the English form rather than the form used locally, for example Moscow for Moskva.

**Titles of articles or monographs** are in the language of the original article unless otherwis stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to th Library of Congress transliteration scheme.

**Abbreviations:**

*Titles of periodicals* are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months ar abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Numbe (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus a entry will read as follows:

*Meteorologische Rundschau*, 2(5–6):146–151, May–June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, *Jahrgang* 2 (Vol 2), *Heft* 5–6 (No. 5 and 6), *pages* 146–151, May–June 1950.

# PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

## COMPENDIUM ARTICLES AND WORKS OF SPECIAL INTEREST

4.4–1 551.5:629.13(02)

Babikov, Maksim Alekseevich, **Aviatsionnaia meteorologiia.** [Aviation meteorology.] Moscow, DOSARM, **1951.** 215 p. 113 figs., 6 tables, 12 refs., 6 appends. **DLC**—This textbook is intended for students of the aviation clubs of the DOSAV (All Union Voluntary Society for the Development of Aviation) and gives elementary concepts of meteorology, weather conditions important to aviation and weather forecasting. Explanations of the techniques of synoptic analysis and the plotting of synoptic maps occupy about two-thirds of the book. The author paid special attention to complicated weather situations and phenomena dangerous to air navigation (fog, showers, sand and snow storms, icing, thunderstorms and tornadoes). Remarks on the meteorological service for aviation are given in the last chapter. Table of synoptic code and examples of synoptic situations are presented in appendix. *Subject Headings:* **1. Elementary meteorology 2. Aeronautical meteorology 3. Textbooks.**—*N.T.Z.*

4.4–2 551.551.1:536.25:550.38

Chandrasekhar, S. (Univ. of Chicago), **On the inhibition of convection by a magnetic field.** *Philosophical Magazine*, London, 43(340):501–532, May **1952.** fig., 20 refs., 194 eqs. **DWB**—In this paper the theory of the stability of a layer of fluid heated below, which has been developed by RAYLEIGH, JEFFREYS, PELLEW and SOUTHWELL, is extended to the case when the fluid considered is an electrical conductor and an external magnetic field is impressed on the fluid. The problem is first investigated on the assumption that the principle of the exchange of stabilities (i.e., the equations governing marginal stability are those which are obtained from the general time dependent equations by setting $\partial/\partial t = 0$) is valid. A differential equation of order six for the normal component of the velocity is derived. Suitable boundary conditions are formulated: they depend on whether the bounding surfaces are free or rigid. The case when the magnetic field and gravity act in the same direction is investigated in some detail. A variational procedure for solving the relevant equations satisfying the necessary boundary conditions and determining the critical Rayleigh numbers for the onset of convection are described. Tables of the critical Rayleigh numbers are provided for the three cases (i) both bounding surfaces free, (ii) both bounding surfaces rigid and (iii) one bounding surface free and the other rigid. Finally, the principle of the exchange of stabilities is examined and it is shown that it is valid if $4\pi\mu < 1$, where $\mu$ is the magnetic permeability, $\sigma$ the electrical conductivity and $k$ the thermometric conductivity. This condition is satisfied under most terrestrial conditions; but under astrophysical conditions it is not. In the latter case, it is shown that instability can arise either as cellular convection or as overstability (i.e., by oscillations of increasing amplitude depending on the magnitude of the velocity of the magneto-hydrodynamic wave ($=\mu H^2/4\pi\rho\upsilon^2$). *Subject Headings:* **1. Convection theory 2. Magnetic fields.**—*Author's abstract.*

4.4–3 551.586:61 551.586:628.8

**Climate, environment and health.** *The Practitioner*, London, 168(1008):555–604, June **1952. DSG**—Includes: Passmore, R. and Sutherland, G. W., "Climate and the distribution of disease" (p. 555–562, 10 refs.); Abrahams, Sir Adolphe, "Climate as a therapeutic agent" (p. 563–569); McDowall, R. J. S., "Body temperature and its control" (p. 570–573); Mole, R. H., "The deleterious effects of exposure to tropical environments" (p. 574–582, 8 refs.); Edholm, O. G., "The effects of excessive cold and their treatment" (p. 583–592, 28 refs.);

Crowden, G. P., "The ideal home. Optimum living conditions in temperate climates" (p. 593–604, 4 figs., 3 tables, 23 refs.). In this symposium PASSMORE and SUTHERLAND describe effects of fog and frost on mortality, general relations between climate and disease, physical and mental effects of hot climates. ABRAHAMS discusses beneficial effect of a change of surroundings and climate, and climatotherapy in general. MCDOWALL deals briefly with balance of heat production and loss and effects of exposure to cold or heat. MOLE discusses heat regulation in desert and jungle and causes of its failure and of heat exhaustion, heat stroke, etc. and tropical neurasthenia. EDHOLM considers general body cooling (hypothermia), local cold injury (trench foot, chilblains) and frostbite. CROWDEN summarizes recent advances in house design in Britain and principles and standards of heating, ventilation and lighting. *Subject Headings:* **1. Bioclimatology 2. Climatotherapy 3. Heating and ventilating. I. Passmore, R. II. Sutherland, G. W. III. Abrahams, Sir Adolphe IV. McDowall, B. J. S. V. Mole, R. H. VI. Edholm, O. G. VII. Crowden, G. F.**—*C.E.P.B.*

4.4–4 551.58:523.4(02)

*de Vaucouleurs, Gérard, **Physique de la planète mars. Introduction à l'aréophysique.** [Physics of Mars. Introduction to Martian physics.] Paris, Albin Michel, **1951.** 420 p. 50 figs., 29 tables, 78 refs., eqs. **GB-MO**—This book gives a surprising amount of information. The Martian atmosphere includes 3 cloud layers: 1) bluish-white clouds at 10–30 km (probably droplets or crystals of $CO_2$ due to intense afternoon convection); 2) a violet layer at 10–15 km (finely divided matter of unknown origin) and 3) a yellow layer at 3–5 km, probably dust. Wind circulation is deduced from cloud drift; a chart for northern winter, with fronts and isobars, rather resembles earth in Jan. Atmospheric pressure at ground $87 \pm 8$ mb, variation with height $z$ (km) given by $\log P_z = 1.94 - 0.025\ z$. S. L. HESS finds a tropopause (about $-160°C$) at 40–50 km. At very high levels there may be an ionosphere and auroras. Air composition: $N_2$, 98.5%; Argon, 1.2; $CO_2$, 0.25; $O_2$, probably under 0.1%; $O_3$ still less. "Martian climatology" gives calculated distribution of radiation, and surface and air temperatures derived by various methods. Soil temperature averages $-23°C$ for whole disc, $-10$ at equator to $-60$ at poles, annual range 120° at S pole, 30° in tropics; diurnal range in tropics 50°C. Dark regions hottest. Air temperature near ground 30° lower than ground. Pt. 3 deals with polar caps, of ice, snow and rime only a few cm thick. A dark fringe in spring is probably liquid water. Deserts are intensely dry; dark areas have more water vapor, but no chlorophyll plants. *Subject Headings:* **1. Planetary climates 2. Mars 3. Textbooks. I. Hess, S. L.**—*C.E.P.B.*

4.4–5 551.571:551.510.52

Dobson, G. M. B. and Brewer, Alan W., **Water vapour in the upper air.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 311–319. 10 figs.) **MH-BH**—The problem of measuring very small water vapor pressures is treated and the construction of a frost-point hygrometer is described. Measurements of water vapor pressure made by means of aircraft ascents are compared with those made with radiosonde balloons. Results are given for the lower stratosphere, and the upper troposphere for different weather situations. *Subject Headings:* **1. Vapor pressure measurement 2. Upper troposphere 3. Stratosphere 4. Compendium articles.**—*A.A.*

4.4–6 551.513

†Fultz, Dave (*Univ. of Chicago*), **Experimental analogies to atmospheric motions.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 1235–1248. 12 figs., 95 refs.) **MH-BH**—The general approach to the study of atmospheric motion by experimental analogs involves the establishment of kinematic similarity in some basic mechanism and the devising of experiments which resemble one or two selected $\pi$-parameters at the expense of similarity in others. There is presented an historical account of the application of experimental technique to the study of (1) rotating phenomena such as cyclones and tornadoes, (2) cold fronts and cyclone systems, (3) thermal convection systems and experiments on the general circulation. The author stresses the fact that the fruitfulness of experimental investigations depends upon "a systematic and sustained effort, guided by theory, to obtain numerical measurements of as great a variety as is practically possible." Suggestions

presented by the author for future experimental research on the general circulation are as follows: the application of the simple techniques, used in hydraulic or aerodynamic experiments for measuring velocity and temperature, to the cylindrical discs of VETTIN, THOMSON and EXNER; the extension of the work of FULTZ to spherical shells with variable depth-radius ratios; studies in paraboloidal shells "rotated at rates such that the free surface figure coincides with that of the paraboloid"; and the investigation of shearing waves and instability at density discontinuity surfaces, in rotating and nonrotating cases, with various geometrical forms. *Subject Headings:* **1. Atmospheric circulation 2. Compendium articles.**—*I.L.D.*

4.4–7 551.594:551.594.2

Gish, O. H. (*Lincoln, Nebr.*), **Universal aspects of atmospheric electricity.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 101–119. 3 figs., 24 refs., 5 eqs.) **MH-BH**—A long descriptive treatment (accompanied by examples of electrograms from Watheroo and Huancayo) of the problem of the origin of and measurement of the earth's electric field, the electrical conductivity of air, the rate of ion formation, and variations in these parameters during good weather, rainy weather, thunderstorms and magnetic storms, and with time of day, season, altitude, etc. Most of the article deals with thunderstorm electricity and its contribution to the supply of electric charges in the atmosphere. The importance of data obtained on the "Carnegie" Cruise is stressed. More detailed data on upper atmosphere and thunderstorm electricity, both physical and statistical, is needed. *Subject Headings:* **1. Atmospheric electricity 2. Thunderstorm electricity 3. Compendium articles.**—*M.R.*

4.4–8 551.5(02)(47) 551.58(02)(47)

Kostin, S. I., **Osnovy meteorologii i klimatologii.** [Fundamentals of meteorology and climatology.] Leningrad, **1951.** 2nd ed. 371 p. 146 figs. (some fold.), 8 tables, 25 refs. **DLC**—A textbook on general meteorology and climatology for forestry and reclamation students in colleges, etc. The influence of plants and forests on the weather and climate, and the influence of weather and climate on plant growth are kept in mind in the various chapters on the structure of the atmosphere, pressure, radiation, soil temperature, air temperature, humidity (water vapor), evaporation, cloud physics, precipitation, air currents, air masses, fronts, cyclonic storms in the section in meteorology; and maritime, continental, mountain, forest and microclimates; distribution of elements over the earth; climatic zones and regions and, finally, the climate of the U.S.S.R. in the section on climatology. Emphasis is given to the artificial influence on climate due to human activity. Many special instruments are described and illustrated and some theory is presented. *Subject Headings:* **1. Meteorology 2. Climatology 3. Forest influences 4. Microclimatology 5. Textbooks 6. U.S.S.R.**—*M.R.*

4.4–9 551.5(02) 55.03(02) 52(02)

†*Landolt, Hans H. and Börnstein, Richard, **Zahlenwerte und Funktionen aus Physik, Chemie, Astronomie, Geophysik und Technik.** [Tables and equations in physics, chemistry, astronomy, geophysics and technology.] 6th ed. Edited by Arnold Eucken. Berlin, Springer, **1950–52.** v. 3. **Astronomie und Geophysik. 1952.** Prepared by Georg Joos; ed. by Julius Bartels and Paul ten Brüggencate. 795 p. tables, charts, figs., bibliogs. **DWB, DLC**—Next to the "Compendium of meteorology" this new addition to Landolt-Börnstein is the most exciting (and most expensive) event in meteorological publication of the past two years. It is the first time a volume on astronomy or geophysics has been included in this famous series of handbooks of physical and chemical tables. It would be impossible to review in detail all of the vast amount of physical data from all parts of the earth, as well as empirical data, which are useful in theoretical calculations of the earth, sea, atmosphere, sun, moon or planets which has been included. In section on **Astronomy,** a sub-section (3109) by H. SIEDENTOPF (p. 30–34) deals with data on the astronomical influence of the earth's atmosphere: astronomic refraction, extinction by gases and by haze in various wave lengths, scintillation and twilight or night sky luminescence). Section 3124 (p. 58–59) deals with Planetary atmospheres and their composition (including the earth). Section 3131 by WALDMEIER (p. 60–76) covers the Solar atmosphere: sunspots, faculae, chromosphere eruptions and protuberances, corona, the 11-year sunspot cycle and solar activity (table of monthly and annual relative

sunspot numbers 1749–1950), and magnetic field of the sun. Section 3132 gives data on Planets, the moon and asteroids or planetoids, temperature and albedo of planets, meteorites, heat radiation from planets, etc. Section 32 on **Geophysics** contains sections on gravity, geodesy, tides, minerals, rocks, seismology, magnetism of the earth, and temperature of the earth's interior. Section 326 on **Oceanography** (p. 426–541) by G. DIETRICH and J. JOSEPH gives hundreds of tables and references on physical and chemical constants of the oceans, sea ice, effect of atmospheric pressure, optics, surface temperature (diurnal and secular variation), salinity, and dynamic oceanography (currents, waves, austausch, tides, ice conditions). Section 327 (p. 542–563) by FRIEDRICH takes up **Hydrography** of flowing water, lakes, ground water, etc. including evaporation, effect of precipitation, hydrologic cycle, etc. Section 328 on **Meteorology** (p. 564–717) has sub-sections: 3281 by R. PENNDORF on atmospheric structure, pressure, temperature and density (p. 564–584); section 3282 contains articles by F. MÖLLER and CHR. JUNGE on $CO_2$ composition, aerosols, cloud physics and precipitation (hail, drop speed and size, etc.) and on **Ozone content** by F. W. GÖTZ; section 3283 on Weather networks and observations by K. KEIL (p. 594–602) and 3284 on **Climate** by R. GEIGER (p. 603–656) with separate section by K. KNOCH and A. SCHULZE on Climatic tables; J. BARTELS, W. DAMMANN, and H. FLOHN on various aspects of climate (variations, cycles, bioclimatology, statistical calculations, climatic extremes, etc.). Section 3285 (p. 657–666) is on **Upper air winds** by K. KEIL; 3286 on **Austausch** by H. LETTAU; 3287 on **Tidal motions in the atmosphere**; 3288 on **Radiation** and atmospheric optics, and 3289 on **Atmospheric electricity.** Paragraph 329 **Physics of the upper atmosphere** (p. 718–781) gives tables and graphs on the ionosphere (W. DIEMINGER), variations in Terrestrial magnetism (J. BARTELS), Aurora (L. HARANG) and Light of the night sky (R. PENNDORF). Section 32A by G. POGADE lists 354 geophysical, meteorological and oceanographical **publications** (current and defunct), which are scientifically important, together with the publishers, editors and period of publication. *Subject Headings:* **1. Geophysical tables 2. Meteorological data 3. Astrophysical tables. I. Eucken, Arnold** (*ed.*) **II. Joos, Georg** (*ed.*) **III. Bartels, Julius** (*ed.*) **IV. ten Brüggencate, Paul** (*ed.*).—*M.R.*

4.4–10 550.3

Landsberg, Helmut E. (*ed.*), **Advances in Geophysics.** v. 1. New York, Academic Press, **1952.** 362 p. figs., tables, refs. Editorial advisory committee, Bernhard Haurwitz, Walter D. Lambert, James B. Macelwane and Roger Revelle. **DLC**—At a time when numerous bulky collections of papers given at conferences, and thousands of articles of ephemeral value, are appearing in a multitude of forms, often poorly edited and difficult to read, one looks back with admiration and nostalgia on the more comprehensive and lasting contributions such as appeared 15–20 years ago in series like the *Ergebnisse der kosmischen Physik*, *Gerland's Beiträge* or *Beiträge zur Physik der freien Atmosphäre.* The war cut off these excellent serials but the know-how with respect to editing and publication has somehow been transplanted from Germany and appears in the form of a new and welcome series published by the Academic Press (analogous to the Akademischer Verlag) and edited by H. E. LANDSBERG who se classic work on condensation nuclei appeared in the *Ergebnisse* in 1938. It remains to be seen whether or not the quality of the monographic articles in "*Advances*" comes up to the quality of those in the pre-war *Ergebnisse* or *Beiträge*, as well as the quality of the edition matches that of its erstwhile counterpart. However, the first volume gives promise that over a period of ten years something of permanent reference value will be achieved, and in a form which will not burden either the eyes or the arms. The series starts with 8 articles in the fields of Statistical methods, Dynamic meteorology, Atmospheric physics, Hydrography, Geodesy and Aeromagnetic surveying, by the well known specialists JOHN BELLAMY, ARNOLD COURT, BERT BOLIN, FRED WHIPPLE, N. C. GERSON, D. W. PRITCHARD, GEORGE WOOLARD and JAMES BALSLEY. (Each of these articles will be abstracted separately and the abstracts published later.) The fields of Hydrology, Seismology, Volcanology, and Tectonophysics are not represented in this first volume. The best feature of this series is (aside from the quality of the reviews and the illustrative and tabular material) the fact that each article contains a logical outline of contents to give the reader a quick impression of the scope of the article, is arranged logically and contains an extensive bibliography, and at the end of the volume there is an author and subject index. What more could one ask? *Subject Headings:* **1. Advances in geophysics 2. Progress in meteorology 3. New serial publications 4. Review articles.**—*M.R.*

4.4–11 551.591:016(02)

†Middleton, William E. K. (*Nat. Research Council Labs., Ottawa, Canada*), **Vision through the atmosphere.** Toronto, Univ. of Toronto Press, **1952.** 250 p. numerous figs., tables, eqs., 420 refs. in bibliog. p. 231–246. **DWB**—We must thank MR. MIDDLETON for doing what authors rarely bother to do—completely rewriting a book which has been quite popular, so that there is scarcely a paragraph one can read that does not contain something new and interesting. Although, the author says, the theory is now far ahead of the applications; and even though the book is full of theory, it is presented very clearly and hints at applications in many fields (e.g., aviation, meteorological observation, forest fire detection, photography, naval operations, etc.) are not wanting. The emphasis in this text is on the physical and psychological aspects of vision, as determined from scores of studies made in the past 15 or 20 years, and a complete elimination of material on the climatological and synoptic relationships which played a prominent part in the earlier text entitled "Visibility in meteorology." The first chapter defines the problem as it now appears and gives a brief history of methods of estimation of visual range. Elementary photometric theory (concepts, units and coefficients) occupies the second chapter. Chap. III summarizes our knowledge of the extinction or scattering of light by the atmosphere. Chap. IV tells how the atmosphere alters the contrast and otherwise affects the horizontal, vertical or slant visibility of distant objects (KOSCHMIEDER's and other theories are explained and illustrated). Chap. V explains the function of the eye in vision (contrast thresholds, color vision, etc.). Chaps. VI and VII tell how to use this knowledge to calculate the visual range of objects (of different sizes and shapes against various backgrounds, or by means of telescopes and cameras in daylight and of lights (searchlights or artificially illuminated objects) by night. Elaborate nomograms are included in these chapters for calculating visual range of objects or lights against the sky or on the ground, and of forest fire smoke. Chap. VIII deals with the color and visibility of distant objects, and Chap. IX with various instruments for measuring extinction, scattering or visual range. These (photometers, nephelometers, or visibility meters) are carefully described and illustrated. Chap. X takes up practical problems of visual range measurement by meteorologists, pointing out that the failure of meteorologists to use the many excellent measuring devices stems from the complete lack of agreement on a definition of "visibility." An attempt is made to rationally relate contrast threshold to visibility observation at airports (scales of visibility are given). Finally, in Chap. XI the substance of the theory, the problem facing the science and future studies which might be made, are reviewed. *Subject Headings:* **1. Visibility 2. Visibility bibliography 3. Textbooks.**—*M.R.*

4.4–12 551.574.1:551.578.41

Nakaya, Ukichiro (*Hokkaido Univ., Sapporo, Japan*), **The formation of ice crystals.** (In: **Compendium of meteorology.** Boston, American Meteorological Society, **1951.** p. 207–220. 28 figs., 2 tables, 15 refs.) **MH-BH**—After a discussion of the physics of freezing of water drops, 5 forms of crystalline frost are outlined and window frost (and the effect of organic substances) or ice described. Historical classifications of snow crystals are mentioned and the present day general system of classification is outlined in detail accompanied by description and sketches of all types of crystals in the classification. The simpler, "Practical classification of snow crystals and solid precipitation" elaborated by the International Commission on Snow and Ice in 1948–9 is also presented. Artificial methods of producing snow crystals and resulting data on growth of snow crystals, and relation of crystals to environment, are next treated. By applying the knowledge of relationship between type of crystal and temperature or supersaturation gained through quantitative laboratory experiments, inferences can be drawn as to structure of upper atmosphere and the source, and temperature of level where snow crystals are produced in nature, when natural crystals are compared with those produced in laboratory. Theories of SHEDD, WEGENER and FINDEISEN as to mechanism of snow crystal formation are evaluated critically. Several examples of inferences drawn from various types of natural crystals are given, the crystals shown photographically and the physical conditions (temperature and humidity of source layer and layers through which crystal fell, time for formation and rate of fall involved) shown graphically and discussed. *Subject Headings:* **1. Snow crystals 2. Ice crystal formation 3. Solid deposits 4. Photomicrographs 5. Compendium articles.**—*M.R.*

4.4–13 551.594(02)(47)

Tverskoĭ, Pavel Nikolaevich, **Atmosfernoe elektrichestvo.** [Atmospheric electricity.] Leningrad, Gidromet. Izdat., **1949.** 250 p. 142 figs., 47 tables, 31 refs., 11 eqs. **DLC**—A textbook presenting a systematic treatment of atmospheric electricity. Special attention is given to thunderstorm electricity. All phenomena are explained by means of physical description and only a minimum amount of mathematical theory is presented. Methods of observation are described. The results of Russian investigations are included here for the first time. The book is intended for scientists in the geophysical field, for candidates for advanced degrees, for senior year students, and for those engineers whose work involves consideration of the electrical phenomena in the atmosphere. The text is divided into five chapters: 1. The electrical state of the atmosphere; 2. Ionosphere; 3. Electrical field of the atmosphere; 4. Thunderstorm electricity and 5. Aurora borealis. *Subject Headings:* **1. Atmospheric electricity 2. Ionosphere 3. Thunderstorm electricity 4. Auroras 5. Textbooks 6. U.S.S.R.**—*I.L.D.*

4.4–14 551.577.2/3(497.2)

*Vranski, Viktor, **Razpredelenie na valezhite v B"lgariia.** [Rainfall distribution in Bulgaria.] Sofia, D'rzhavna Pechatnitsa, **1945.** 2 v. figs., fold. maps, tables. In Bulgarian. German summary p. 370–390. (Bulgarska Akademiia na Naukite, Sofia.) **DWB**—A monumental work on precipitation distribution (variations in space and time) in Bulgaria, based on all the available statistical data, for 1899–1936. Series of tables and charts, many of them large and in color are included. The most important works on precipitation in Bulgaria are reviewed. The theory of precipitation formation is explained at great length, and the methods of compiling and analyzing the data elaborated. Then mean monthly precipitation and percentage of annual in each month for each of 282 stations are given in separate tables and graphs. The annual variations, regional peculiarities, a list of stations with coordinates and old and new names, etc. are included. *Subject Headings:* **1. Precipitation distribution 2. Precipitation variations 3. Bulgaria.**—*M.R.*

## GENERAL METEOROLOGY

*See also:* **Aviation meteorology** (Babikov), **4.4–1**; **Tables and equations** (Landolt and Börnstein), **4.4–9**

4.4–15 551.5(438):016

†**Piśmiennictwo polskie w roku 1949 (II) i 1950 (I).** [Polish literature in 1949 and 1950.] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:237–240, **1951. DWB**—A list of recently published Polish books, periodicals, and continuous publications on meteorology and hydrology. *Subject Headings:* **1. Meteorology 2. Hydrology 3. Bibliographies 4. Poland.**—*W. Tomczykowski.*

4.4–16 551.5(04)

Brunt, Sir David, **Editorial.** *Royal Meteorological Society, Quarterly Journal*, 78(338):485–487, Oct. **1952. DWB**—Notes on meteorology at Imperial College of Science and Technology since 1920, progress of meteorology and practical applications. *Subject Headings:* **1. Progress in meteorology 2. Imperial College of Science and Technology, London.**—*C.E.P.B.*

4.4–17 551.5(04)

Hellpach, W., **Meteorologie und Leben.** [Meteorology and life.] *Germany. Deutscher Wetterdienst in der U.S.-Zone, Berichte*, No. 35:7–11, **1952. MH-BH**—An address comparing meteorology with mythology. Moazagotl comes from Gottlieb Matz, an early weather prophet of the Riesen Gebirge; other items of weather lore are mentioned. Then discusses teaching of meteorology, research and its unexpected results. *Subject Headings:* **1. Addresses 2. Meteorology 3. Weather lore.**—*C.E.P.B.*

4.4–18 551.5(05)

Japan. Central Meteorological Observatory, Tokyo, **Weather service bulletin.** First issue received, 18(20), Nov. **1951.** Last issue received 19(8), April **1952.** Semimonthly.

In Japanese, title page in Japanese and English. Many illus. with English legends. Refs. in original language. **DWB**—This periodical contains original articles of a didactic nature in synoptic and dynamic meteorology, reviews of works in the *Journal of Meteorology, Royal Meteorological Society, Quarterly Journal, Meteorologische Rundschau* and similar scientific periodicals, lists of accessions in the CMO library, instructions for maintenance of instruments (such as cleaning barometers) all in Japanese with considerable illustration material, tables, weather charts, cross sections, schematic diagrams, etc. The March 1952 issue (V. 19, No. 5) contains a long article on the use of the U.D.C. system in Japanese libraries, with examples of catalog cards using Japanese and Roman script respectively, but both with U.D.C. classification. *Subject Headings:* **1. Periodicals 2. Meteorological service bulletins 3. U.D.C. catalogs 4. Japanese language 5. Japan.**—*M.R.*

4.4–19 551.5(26):551.46(438)

Rojecki, Ananiasz, **Stan obecny, zadania i potrzeby oceanografii w Polsce.** [Actual state, tasks and needs of oceanography in Poland.] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:281–302, **1951. DWB**—This article discusses chemical, biological and physical oceanography and the geography and geology of the seas. The problems of the interaction of sea and atmosphere, of navigation and of marine cartography are considered. The status of this science in Poland is compared with its status in the world. *Subject Headings:* **1. Oceanography 2. Ocean-atmosphere interaction 3. Marine meteorology 4. Poland.**—*W. Tomczykowski.*

4.4–20 551.5:001(469.0)

Portugal. Serviço Meteorológico Nacional, **Termos descritivos da força do vento, do estado do mar e da visibilidade.** [Terminology descriptive of the wind force, the state of the sea and of visibility.] *Portugal. Serviço Meteorológico Nacional, RT* 103, CIR 43, Feb. 26, **1952.** 1 p.—Portuguese terms for the 12 point code scale of wind force, 9 degrees of wave activity and 9 visibility classes are listed without definition of physical equivalents to the terms. *Subject Headings:* **1. Terminology 2. Portuguese language.**—*G.T.*

4.4–21 551.5:016(98/9)

†Breitfuss, Leonid (*Deutsches Hydrogr. Inst., Hamburg*), **Erforschung der Polargebiete, 1932–47.** [Research in the Polar regions, 1932–47.] *Geographisches Jahrbuch*, Gotha, v. 60, **1950.** 320 p. **DLC**—Each section of this comprehensive bibliography contains many references to the meteorology or climatology of some part of the polar regions. The material is arranged systematically by region. First, the Arctic and Antarctic together (climatology, p. 30–31), then the Arctic in general, (climatology, p. 49–57), the Eurasian Arctic in general (climatology, p. 78–81), West Europe (Scandinavia, Svalbard, Iceland and Jan Mayen), East Europe (U.S.S.R., Franz Joseph Land, Novaya Zemlya), North Asia (North Siberia, West Siberia, East Siberia); North America (General, Alaska, Canada, Greenland) and, finally, the Antarctic. In most sections, besides the climatological subsection, there is one on oceanography, one on glaciology and one on geophysics. In all, there are hundreds of references of interest to meteorologists and summaries of progress in each field at the end of each subsection. *Subject Headings:* **1. Climatological bibliographies 2. Arctic bibliographies 3. Antarctic bibliographies 4. Oceanographic bibliographies 5. Arctic 6. Antarctica.**—*M.R.*

4.4–22 551.5:06(676)

†Davies, D. A. (*Dir. East African Met. Dept.*), **East Africa's weather service.** Foreword by Robert Scott. Nairobi, Eagle Press [**1952.**] 32 p. 8 figs., (incl. port.), form. Append. A: **Glossary of technical terms;** append. B: **List of publications of the Department.** Price: Sh 2/50. **DWB**—An attractive pamphlet describing the East African Weather Service, with illustrations showing observational procedures of various types, forecast briefing, the director, and a sample weather chart and flight forecast (cross sectional) from Eastleigh to Johannesburg. The text describes use of past weather records, the forecast service, preparation and interpolation of forecasts, radio and radar aids, artificial rain stimulation experiments, and the organization of this service which operates in Kenya, Tanganyika, Uganda, Zanzibar and the

Seychelles. *Subject Headings:* **1. East Africa High Commission. Meteorological Departmen 2. Meteorological services 3. Forecasting services 4. East Africa. I. Scott, Robert.**—*M.R.*

4.4–23 551.5:523.4(

Rubashev, B. M., **Activnye protsessy v atmosfere Saturna.** [Active processes in th atmosphere of Saturn.] *Priroda*, Moscow, No. 5:51–52, May **1951.** 15 refs. **MH-BH**— Disturbances in the Saturn atmosphere in 1949 are discussed. Author points out that 194 is second to 1947 as a year of high solar activity, and that the current epoch is a maximun epoch of its secular cycle; he describes the unusual phenomena: brightness of the equatoria zone, nearly white spots, light shades, dark spots between the chronographic latitudes −10° and −30°, thin strip the whole length of the equatorial belt, etc. Emphasis is placed or Saturn's ring, similar phenomena of which were observed in 1898. Appearance of white spots was recorded in 1933, in 1903, and in 1870. The intervals of about 30 years coincide with th period of Saturn's rotation around the sun (29.46 years). Thus the author has indicated tw possible causes of increase in activity. *Subject Headings:* **1. Planetary atmospheres 2. Saturn** —*A.M.P.*

4.4–24 551.5:92

Keränen, J., **Harald Wilhelm Lunelund.** *Geophysica, Meteorology Ser.*, Helsinki, 4(1):1–3 **1951. DWB**—Born July 27, 1882 in Viipuri (Finland), died Feb. 17, 1950. Professor o physics at the Helsinki University. The list of publications includes many meteorological papers, especially on the radiation climate of Finland. *Subject Headings:* **1. Biography 2. Lunelund, Harald Wilhelm 3. Radiation climate 4. Publication lists. 5. Finland.**—*A.A*

# METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

## METHODS OF OBSERVATION

*See also:* **Units and standards of measurement at National Physical Lab., Great Britain,** 4.4–26; **Methodological instructions and fundamental phenological observations** (Rudenko), 4.4–44; **Time sections of lowest 500 ft** (Holland), 4.4–65; **700 mb charts, summer 1950** (Okuta), 4.4–69; **Climatological data analysis for spring cloud seeding, N. Central Colo.** (Resnick), 4.4–81; **Solar radiation, its measurement** (Wegener), 4.4–126; **Rainfall characteristics at Trangie Agricultural Experiment Station** (Cuthbertson), 4.4–198; **Vertical distribution of snow cover and snow fall, Veneta Region** (Dona), 4.4–214; **Estimate of soil moisture during non-precipitation period** (Umetani), 4.4–227; **Climatological investigation, U.S.S.R.** (Selianinov), 4.4–230

4.4–25 551.501.1(02)(47)

Leningrad. Glavnaia Geofizicheskaia Observatoriia, **Rukovodstvo meteorologicheskim stantsiiam 3-go razriada.** [Manual for 3rd class meteorological stations.] Moscow, Gidrometeorol. Izdat., **1941.** 62 p. 8 figs., numerous tables. **DWB**—The program of the 3rd class meteorological stations in the U.S.S.R. provides for measurement of precipitation, depth and density of snow cover, and registration of different phenomena observed without instruments. Complete descriptions of meteorological phenomena, instruments, procedures of observation, and lists of symbols used for records of phenomena are the principal content of the book. Special attention is also paid to observations of opening and freezing of rivers, phenological data, and damage caused by glazed frost, rime, etc. Forms of monthly tables and procedures of tabulation, with numerous examples, are given in the last chapter. *Subject Headings:* **1. Observers manuals 2. Observation techniques 3. U.S.S.R. I. Orlov, G. I. II. Spengler, O. A. III. Smirnova, I. V. IV. Andreev, E. A.**—*N.T.Z.*

4.4–26 551.501.3 551.508.41(389)

Great Britain. National Physical Laboratory, **Units and standards of measurement employed at the National Physical Laboratory. I. Length, mass, time, volume, density and specific gravity, force and pressure. II. Light, photometry, colorimetry and radiometry.** London, Dept. of Scientific and Industrial Research, **1951–1952.** 12 p. 23 refs.; 9 p. 5 refs.

**GB-MO**—Values of fundamental and derived units and standard abbreviations and symbols are given. International Å = $6438.4696 \times 10^{-10}$ m. A section on barometric pressure is included. *Subject Headings:* **1. Units 2. Barometry.**—*C.E.P.B.*

4.4–27 551.501.4:517.512.2

Ekhart, E., **Zur harmonischen Analyse.** [On harmonic analysis.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):235–242, **1952.** fig., 9 refs. German, English, French summaries p. 235. **DWB**—A scheme for harmonic analysis of 24 terms is set out. The "harmonic dial" is an elegant single vector way of representing changes of amplitude and phase in space or time. Author then discusses harmonic analysis of vectors, e.g., annual variation of wind. *Subject Heading:* **1. Harmonic analysis.**—*C.E.P.B.*

4.4–28 551.501.4:551.509.3

**Machine predicts weather.** *Science News Letter*, 61(25):386, June **1952. DLC**—The release of a new electronic computer adapted to preparing weather forecasts is announced. The instrument was developed at the Institute for Advanced Study at Princeton, N. J. and is said to be able to prepare a 24-hour forecast in 48 minutes instead of 48 hours as required by the larger ENIAC. Dr. von Neumann was in charge of the design and construction and Dr. Charney carried out the forecasting problems. *Subject Headings:* **1. Electronic computers 2. Mathematical forecasting. I. Charney, Jule G. II. von Neumann, John.**—*G.T.*

4.4–29 551.501.45:551.586

de Rudder, Bernhard, **Zur Korrelations- und Koinzidenzforschung in der Meteorobiologie bezw. Biometeorologie.** [On correlation and coincidence investigations in meteorobiology and biometeorology.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:254–256, **1952.** 22 refs. **DWB**—A brief summary of the difficulties in the search for biotropic factors such as solar relations, weather disturbances, etc. *Subject Headings:* **1. Methods of computation 2. Bioclimatology.**—*C.E.P.B.*

4.4–30 551.501.7:551.507.352

Höhndorf, Fritz, **Eine Bemerkung zu den "Doppelschichtungen" in der Atmosphäre.** [A remark on "double stratification" in the atmosphere.] *Meteorologische Rundschau*, 5(7/8):141, July/Aug. **1952.** fig. **DWB**—Apparent double or multiple stratification in upper air investigation is regarded as illusory, caused by aircraft path intersecting waves in a single discontinuity. *Subject Heading:* **1. Airplane weather reconnaissance.**—*C.E.P.B.*

4.4–31 551.501.7:551.557

Johnson, D. H., **A note on the accuracy of 100 mb. winds.** *Great Britain. Meteorological Research Committee, M.R.P.* 739, July 18, **1952.** 3 p. fig., 2 refs. Mimeographed. **DWB**—Winds at 100 mb are generally coherent in space and time, e.g., W. Europe 17.3.52. Hence, winds at 3 collinear equally spaced stations can give root-mean-square error at middle one. For British stations it is appreciably below 6 kt. *Subject Heading:* **1. Upper air wind computation.**—*C.E.P.B.*

4.4–32 551.501.7

Väisälä, Vilho (*Helsinki Univ., Inst. of Met.*), **Renewed diagram paper (aerogram) for aerological sounding work.** *Geophysica*, Helsinki, 4(1):31–32, **1951.** 3 refs., diagram paper. **DWB**—Although the author does not quite agree with the introduction of a new unit, the geopotential meter, he has, nevertheless, altered his aerogram paper in accordance with this new unit. The changes are briefly discussed and the new diagram shown. *Subject Heading:* **1. Aerograms.**—*A.A.*

4.4–33 551.501.7:551.557:551.542.1

Wasko, P. E. (*U. S. Air Weather Service, Wash., D. C.*), **A simplified method of determining geostrophic wind spacing of contours.** *American Meteorological Society, Bulletin*, 33(1):12, Jan. **1952. MH-BH**—By substituting a contour spacing of 400 ft in one degree of latitude in the geostrophic wind equation $v\ (\frac{1}{2}w \sin \phi)\ (dz/dn)$, author finds the final formula $(v/10)dn = c$,

where $c$ is a constant for a given latitude. Constants for each 5 degrees of latitude are presente in a table and an easy way of memorizing them suggested. Practical value of using th technique is pointed out. *Subject Headings:* **1. Methods of computation 2. Geostrophi winds.**—*G. T.*

4.4–34 551.501.83:551.513.

Jones, Herbert L. and Hess, Philip N., **Identification of tornadoes by observation o waveform atmospherics.** *Institute of Radio Engineers, Proceedings*, 40(9):1049–1052, Sept 1952. 9 figs. **DLC**—Research on sferics from tornadoes, conducted since 1947 at Oklahom Agriculture and Mechanical College, is reported. Apparatus consisting of detecting an amplifying elements and automatic photorecording device is described and shown in circui diagrams. Results for the seasons 1950 and 1951 are discussed and records of thunderstorm and tornado sferics reproduced. High frequency components were observed to appear during tornado activity only and to be nonexistent during ordinary thunderstorms. The number o such discharges in the 200 to 400 kc band was found to increase as the tornado stage is ap proached. *Subject Headings:* **1. Sferics 2. Tornado location 3. Sferics detectors.**—*G. T.*

4.4–35 551.501.9:551.506.5(98)

Bouché, Michel, **Groenland Station Centrale.** [Central Station, Greenland.] Paris, Grasset, 1952. 262 p. 8 plates, 3 fold. diagrs. Preface by Paul-Émile Victor. Price: 570 frs. **DWB**—A long narrative history of the establishment and maintenance of the French Station on the Central Greenland Ice Cap in 1949 (the first exploratory expedition took place in 1948), with many photographs showing exposures of instruments, difficulties in making observations and launching of balloons, quarters dug out of the ice, etc. Maps and sketches show location of station, routes of various air and sea expeditions to establish or supply the station, lists of personnel during 1949, 1949–50, 1950, and 1950–51 phases. Work includec aerial surveys, glacialogical, geodetic, seismic, topographic, geologic and meteorological observations. The station was still in existence at date of publication. *Subject Heading* **1. Arctic weather stations 2. French Greenland Expedition 3. Greenland Icecap. I. Victo Paul-Émile.**—*M. R.*

4.4–36 551.501.9(98)

Davidson, Bill (*assoc. ed. Colliers*), **On guard at the Pole.** *Colliers*, N. Y., p. 15–18, 72 74–77, June 14; p. 28–30, 70–72, June 21; 24–25, 63–65, June 28, **1952.** photos. **DWB**—*A* popular article describing equipment, activities and life in general on the Arctic ice pack and at land stations in Greenland and the Canadian Arctic. A map shows location of many routes from U. S. to Eurasia. Photographs show weather stations at Alert and on Greenland, balloon ascents, radiosonde buildings, and CHARLES J. HUBBARD (who established many of these stations before his accidental death in a plane crash at Alert). *Subject Headings:* **1. Arctic weather stations 2. Alert, Canada 3. Canadian Arctic 4. Greenland. I. Hubbard, Charles J.**—*M. R.*

## OBSERVATIONAL DATA

*See also:* **Central Station, Greenland** (Bouché), 4.4–35; **Ozone** (Dobson), 4.4–89; **Precipitation depths, Munich 1848–1950** (Reichel), 4.4–203; **Weather in Italy, April–Sept. 1951** (Bernacca), 4.4–235; **Medical meteorological supplement** (NW Germany, Met. Amt), 4.4–253

4.4–37 551.506.2(493.6)

de Thier, H. and Dufour, L., **Sur d'anciennes observations météorologiques effectuées à Verviers par G. Godart en 1755, 1756 et 1757.** [Early meteorological observations made at Verviers by G. Godardt in 1755, 1756 and 1757.] *Ciel et Terre*, 68(3–4):65–66, March–April 1952. **DLC**—The author quotes some notes on the weather which he found among the papers of DR. G. GODART, Belgian physician. The notes contain a general description and a few details of the wind, precipitation and temperature conditions from 1755 to 1757. Temperature and pressure data are given for days with exceptional weather. These notes, the

Author explains, comprise the earliest meteorological instrumental observations reported in Belgium. *Subject Headings:* **1. Historic weather records 2. Verviers, Belgium. I. Godart, G.**—*G.T.*

4.4–38 551.506.3:551.577.3(415)

*Grew, Sheelagh, **Meteorology at Armagh Observatory: general notes and a study of rainfall.** *Irish Astronomical Journal*, 1(8):230–237, Dec. **1951.** 2 figs., 7 tables. Abstracted from reprint. **DWB**—The observatory was founded in 1790. Meteorological observations begun in 1794 have continued to the present. Only observations made since 1840 are considered in the rainfall study. Types of gages and locations of gages varied through the years so an attempt was made to reduce the observations to a single uniform system. The 8-in. gage which has been in use since 1885 was taken as the standard and all other gages reduced to that standard. Table gives conversion factors, probable error and number of observations. Other tables give mean monthly and annual rainfall for 10-year periods from 1840–1949, wettest and driest month for 1840–1950 and a comparison of the mean number of "wet days" (0.04") per month for 1850–1899 and 1900–1949. Some of the data are shown graphically. *Subject Headings:* **1. Precipitation variations 2. Long period records 3. Rain gages 4. Armagh Observatory, Ireland.**—*M.L.R.*

4.4–39 551.506.3(42)

Manley, Gordon, **Thomas Barker's meteorological journals, 1748–1763 and 1777–1789.** *Royal Meteorological Society, Quarterly Journal*, 78(336):255–259, April, **1952.** fig., 2 tables, 3 refs. **DWB**—Discussion and reduction of temperature records kept at Lyndon Hall, Rutland, 1748–1763 and 1777–1789, with monthly values 1748–1763, and frequencies of snow or sleet (i.e., snow+rain). Results compared with recent records show colder winters and warmer summers. *Subject Headings:* **1. Historic weather records 2. Lyndon, England. I. Barker, Thomas.**—*C.E.P.B.*

4.4–40 551.506.5(491)

Hannell, F. G. and Stewart, R. H. A., **Meteorological observations in central Iceland.** *Meteorological Magazine*, London, 81(963):257–263, Sept. **1952.** 5 figs., 2 photos, 5 tables, refs. **DWB**—Observations at 4 stations N, E, S and W of Hofsjökull ice cap, Aug. 10–Sept. 4, 1951, are analyzed, especially surface winds, which show effect of wind off the ice cap and convection over bare plateau. On Sept. 4 a secondary depression formed over this plateau. *Subject Headings:* **1. Expeditionary climatic data 2. Iceland.**—*C.E.P.B.*

4.4–41 551.506.5(99)

Schumacher, Nils Jörgen, **The Maudheim Expedition, 1949–52. Part 1.** *Weather*, 7(10):314–319, Oct. **1952.** 3 plates. **Pt. 2. Upper-air investigations.** *Ibid.*, 7(11):327–334, Nov. **1952.** table, 2 plates. **MH-BH**—Pt. I is an account of the instruments set up at 71°3′S, 10°56′W, in a Norwegian screen, and of difficulties in making surface meteorological observations. Records included vertical gradient of wind and temperature. Pt. II, account of methods of generating hydrogen and releasing sondes, and notes on surface (with temperature table) and upper air conditions obtained from these soundings, on optical phenomena and on planning a meteorological expedition. *Subject Headings:* **1. Maudheim Expedition 2. Antarctica.**—*C.E.P.B.*

4.4–42 551.506.7:551.509.317

Bartsch, Joachim, **Eine neue Methode zur Verarbeitung aerologischen Materials im praktischen Dienst.** [A new method of working up aerological material in the practical service.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:320–323, **1952.** **DWB**—A simple method is described of combining the relative heights of 1000, 850, 700 and 500 mb to give a summary of the vertical structure of the atmosphere over large areas. *Subject Heading:* **1. Upper air analysis.**—*C.E.P.B.*

4.4–43 551.506.8:633.1(436/7)

Rosenkranz, Friedrich (*Vienna*), **Von der Keimzeit des Sommerhafers.** [Germination period of summer oats.] *Wetter und Leben*, Vienna, 3(11/12):256–257, Dec. **1951.** **MH-BH**—

A phenological analysis of the planting and germination dates of summer oats in Czechoslovakia and Austria indicates that with sowing dates later than early March the interval between sowing and germination diminishes until a minimum is obtained between April and early May. The interval between sowing and germination may decline from 25 or 30 days to 12 days, and depends upon height, location and variety of oats. Statistical data on various intervals between sowing and germination for various elevations are presented. *Subject Headings:* **1. Phenology 2. Grain crops 3. Austria 4. Czechoslovakia.**—*I.L.D.*

4.4–44 551.506.8:551.501.1(47)

Rudenko, A. I., **Metodicheskie ukazaniia i programma osnovnykh fenologicheskikh nabliudenii.** [Methodological instructions and the program of fundamental phenological observations.] *Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia*, 83(4):395–411, July–Aug. **1951.** tables. **DWB**—This is a comprehensive outline of the procedure and objects of phenological observations carried out in the U.S.S.R. The author discusses the selection of sites for phenological observations and of objects of observation, the time for making phenological observations, criteria for assessing the stage of harvest, the intensity of flowering and the formation of ovaries. The various phases of development in trees, shrubs, grasses and crops are described. Phenological observations on birds are considered. The relevant hydrometeorological observations are discussed. The plants and animals (birds, fishes, insects, etc.) upon which observations are to be made are listed and a sample phenological form is given. *Subject Headings:* **1. Phenology 2. Observation techniques 3. U.S.S.R.**—*I.L.D.*

4.4–45 551.506.8:551.586:58(439.1)

Szöke, Klára, **A vadontermö növények agrometeorológiai megfigyelése.** [Phenological observations in natural vegetation.] *Időjárás*, 54(5–6):156–158, May–June **1950. MH-BH**—Author gives a few instructions to those who, as members of the rapidly growing Hungarian agro-meteorological service, take part in the project concerned with reporting seasonal development of wild plants. Twenty-two trees and 12 species of bushes have been selected for reports which are to refer to 6 determined stages in the plants' development. It is pointed out that a total of 100 agro-meteorological stations is planned for Hungary by the end of 1951 and 400 at the end of the five-year plan. *Subject Headings:* **1. Phenology 2. Agro-meteorological stations 3. Hungary.**—*G.T.*

## INSTRUMENT CARRIERS

*See also:* **Double stratification in atmos.** (Höhndorf), 4.4–30; **Rocket and meteor research** (Whipple), 4.4–88; **Example of flight through thunderstorm updraft** (Byers), 4.4–123

4.4–46 551.507.321.2

Rössler, Fritz, **Untersuchungen an Gummiproben und Registrierballonen.** [Investigations of rubber samples and registration balloons.] *Germany. Deutsche Demokratische Republik. Meteorologischer Dienst, Veröffentlichungen*, No. 6, **1952.** 68 p. 20 figs., 21 tables. **DWB**—A comprehensive technical investigation made in 1944 at the meteorological observatory at Wilhelmshaven, Germany. Different samples of natural and artificial rubber balloons were tested in the laboratory and during ascents. The influence of rubber quality and thickness, and of temperature, ozone and ultraviolet radiation on the heights reached are discussed. The bursting height was found inversely proportional to the initial thickness. Balloons should be of large diameter and thin rubber. *Subject Headings:* **1. Balloon research 2. Germany.**—*A.A.*

4.4–47 551.507.352:551.509

Behrens, George, **20th century Magellans.** *Skyways*, New York, 10(9):20–21, Sept. **1951.** figs. **DLC**—Popular account of weather flights carried out by the 56th Strategic Reconnaissance Squadron, Air Weather Service, U. S. Air Force, operating from a base in Northern Japan. The flights are reported to have involved an average of two 3,000-mile weather missions a day during the year preceding the account. Weather observation, including locating and tracking typhoons, is indicated as purpose of the flights. Observations are

eported from positions predetermined along the flight track at 100-mile intervals. *Subject Ieadings:* **1. Airplane weather reconnaissance 2. Typhoon observation 3. Typhoon tracks.** *–G.T.*

4.4–48 551.507.362

Grant, Lewis J. Jr., **A suggested design project on an orbit rocket.** *Journal of Space Flight*, 3(1):1–5, Jan. **1951.** 2 refs. **DLC**—A suggestion and an outline for planning an "orbiter" for the purpose of obtaining necessary information and data to make possible the stablishment of a space ship. Meteorological data that may be obtained by instruments board the "orbiter" are: variability of the solar constant, air density, albedo of earth, and loud pattern over a long period of time (from 500 miles up); auroras, power, size and ionization otentials of cosmic rays, long period recording of meteor hits (and the orbiter itself), tem- erature drop in the earth's shadow, and conditions of radio reception on the "orbiter." *Sub- ect Headings:* **1. Orbit rockets 2. Outer atmosphere 3. Space observations.**—*W. N.*

4.4–49 551.507.362

**Viking flights prove research worth.** *Aviation Week*, New York, 54(3):24–26, 28, Jan. 15, **951.** photos. **DLC**—Report on research rockets built by the Glenn E. Martin Co. Alti- udinal results of 6 rockets hitherto launched are mentioned, 2 of them representing record eights for American-built rockets (106 and 107 mi). Four more rockets are reported under onstruction. Rockets at various stages of operation and control instruments are shown in hotographs. *Subject Headings:* **1. Martin Viking rockets 2. Rocket development 3. Rocket ltitudes.**—*G.T.*

## INSTRUMENTS

*See also:* **Organization of actinometric works, Poland** (Gorczýnski), **4.4–125; Investiga- tions of natural aerosols by electron microscope** (Jacobi), **4.4–185; Observations of natural precipitation processes** (Cunningham), **4.4–201; Hofman's apparatus for measuring soil humidity** (Geiger), **4.4–220**

4.4–50 551.508.91

Casella (C. F.) & Co. Ltd., London, **Aitken nucleus counter.** *Casella, C. F. & Co., Leaflet*, 24, [n.d.] 4 p. illus. **DWB**—This classical instrument is shown on a photograph and escribed. It consists of a chamber filled with pure air saturated with water vapor, into which sample of air under test is introduced. Water drops form and fall on to a glass stage, their umber depending on the number of hygroscopic particles (condensation nuclei) in the air ample investigated. The water drops are easily counted by means of a low-power eyepiece nd dark ground illumination. The manufacturers claim a standard error of about 9% in an xperiment in which 20 consecutive samples were taken. *Subject Heading:* **1. Aitken counters.** *–G.T.*

4.4–51 551.508.91

Effenberger, Ernst, **Das Staubproblem in der Meteorologie und in der Hygiene.** [The ust problem in meterorology and hygiene.] *Germany. Deutscher Wetterdienst in der US- one, Berichte*, No. 35:253–257, **1952.** 4 figs., 15 refs. **MH-BH**—Author describes instru- ients and methods of studying solid aerosols, which have been adopted in Hamburg. *Subject Ieading:* **1. Aerosol measurement.**—*C.E.P.B.*

4.4–52 551.508.91

Harteck, Paul and Hertz, Gerhard, **Über eine Diffusionsnebelkammer mit vertikal ufwärts gerichtetem Diffusionsstrom.** [On a diffusion cloud chamber with a diffusion stream irected vertically upwards.] *Naturwissenschaften*, 39(9):206–207, May 1, **1952.** fig., 5 refs. **WB**—Describes a simplified and improved form of LANGSDORF's cloud chamber, developed the U. S. (*see* 4.4–54 below). *Subject Headings:* **1. Nuclei counters 2. Cloud chambers.**— *E.P.B.*

4.4–53 551.508.91:551.510.42

Hemeon, W. C. L. (*Industrial Hygiene Foundation, Pittsburgh*), **Instruments for air pollution measurement.** *Meteorological Monographs*, Boston, 1(4):20–23, Nov. **1951.** fig. 2 refs. **MH-BH**—The instrumental requirements for air pollution measurements are indicated in their broad outlines. The measuring technique should reflect the nature of the pollution effect. Pollution by particles presents a special problem: a knowledge of the range of particle sizes composing it, in addition to the mass concentration, is required to assess the significance of the pollution; the soiling effect of the pollutant should also be determined. The possibilities of using light-obscuring and corrosion effects are examined. Finally, the interrelationship between objectives of a study and measuring techniques to be used is emphasized. *Subject Headings:* **1. Atmospheric pollution instruments 2. Industrial meteorology.**—*Author's abstract.*

4.4–54 551.508.91

Langsdorf, Alexander, Jr. (*Argonne National Lab., Chicago, Ill.*), **The diffusion cloud chamber.** *Industrial and Engineering Chemistry*, 44(6):1298–1300, June **1952.** 25 refs. **DLC**—A vapor diffuses through a non-condensing gas from an origin in a nearly saturated region into a colder region. A high degree of supersaturation is produced in part of the gas volume. The attainment of a steady-state supersaturation is convenient for studies in nucleation. The rapidity of re-establishment of equilibrium within the apparatus, compared to expansion cloud chambers, is another advantage. The history of the diffusion cloud chamber is reviewed, and some suggestions are made concerning its use in nucleation studies. *Subject Headings:* **1. Cloud chambers 2. Nuclei counters 3. Supersaturation.**—*Author's abstract.*

4.4–55 551.508.91

Lee, Piu-kum, **Forward angle scattering aerosol camera.** Columbia University. Colloid Research Laboratories, Contract AF-19(122)-164, Scientific Report No. 1, Nov. 30, **1951.** 13 p. 4 figs., 10 refs., eqs. **DWB**—The investigation of the size-frequency distribution of aerosol droplets by photography using the Forward Angle Scattering Aerosol Camera was continued. Conversion curves relating the size of dioctyl phthalate (D.O.P.) aerosol droplets with the optical density of their images on the film were constructed under different photographic conditions. With the present camera-assembly, the size range 0.1 micron to 0.45 micron radius can be studied. This range may be extended somewhat by modifying the apparatus and procedure. Size-frequency distribution of two different sized aerosols and their mixture was measured. There was good agreement between the predicted and the measured distribution curves of the mixture. *Subject Headings:* **1. Aerosol cameras 2. Aerosol measurement. I. La Mer, Victor K. II. Columbia University. Colloid Research Laboratories III. Contract AF-19(122)-164.**—*Author's abstract.*

4.4–56 551.508.91:551.576.8

Reifferscheid, H., **Zur Methodik der Keimgehaltsbestimmungen der Luft.** [On the methodology of germ determination of the air.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:256–258, **1952.** 2 figs., table, 14 refs. **DWB**—A discussion of the methods of investigation of bacteria and similar small organisms in the air-microscopes, filters etc. The "biological konimeter" is described. Some preliminary results are quoted. *Subject Headings:* **1. Aerosol measurement 2. Aeroplankton.**—*C.E.P.B.*

4.4–57 551.508.91

Schaefer, Vincent J. (*Gen. Elec. Res. Lab. Schenectady*), **Continuous cloud chamber.** *Industrial and Engineering Chemistry*, 44(6):1381–1383, June **1952.** 2 figs., 8 refs. **DLC**—The author describes two types of continuous cloud chambers (a nuclei-free and an open-base chamber) which he developed to supplement the ordinary cold chamber for studying atmospheric processes related to warm, cool and cold clouds. Schematic diagrams of the two chambers are presented. The continuous cloud chamber is particularly suited for studying growth of ice crystals, effect of dry ice seeding and formation of AgI particles. *Subject Heading* **1. Cloud chambers.**—*G.T.*

4.4–58 551.508.92:523.59

*Huruhata, Masaaki (*Tokyo Astron. Obs.*), **Photoelectric study of the zodiacal light.** *Astronomical Society of Japan, Tokyo, Publications*, 2(4):156–171, **1951.** 15 figs., 9 tables, 13 refs. **DLC**—Values of zodiacal light obtained between 1945 and 1949 at Tokyo Univ. Observatory with a cesium-cell (red-sensitive) and an antimony-cell (blue sensitive) photometer, with emphasis on the latter, are tabulated and analyzed. Data on yearly variation of brightness, on relative intensities calculated for different elongations, on the hourly rate and observed brightness of Taurid meteors, on observed polarization of zodiacal light, etc., are presented in tabular and graphical form. Meteoric particles along the orbit of comet Encke were found to be the major source of bright zodiacal light in fall and spring. This was confirmed by polarization measurements. Observation was extended to high ecliptic latitudes, including regions of minor zodiacal light quantity never before investigated. Zodiacal light in the solar corona discussed. *Subject Headings:* **1. Zodiacal light 2. Photometers 3. Tokyo, Japan.**—*G.T.*

4.4–59 551.508.93:621.383:546.289

Dunlap, W. C., Jr., **Germanium photocells.** *General Electric Review*, 55(2):26–31, March **1952.** 8 figs., refs. **DWB**—General principles of the use of photoelectric cells as a means for measuring and controlling light of varying intensities and wave lengths are explained. Optical and photoelectric properties of germanium are discussed and a formula for the output voltage of the germanium P-N junction cell presented. The structure, characteristics, practical values and advantages of germanium photocells are described and represented on diagrams and curves. *Subject Headings:* **1. Photoelectric cells 2. Germanium photocells 3. Illumination meters.**—*G.T.*

4.4–60 551.508.93:551.576.2

Wingler, Hermann, **Helligkeitsunsymmetrie-Messgerät für automatische Bewölkungsanzeige.** [An apparatus for measuring unequal sky brightness to register cloudiness automatically.] *Baden. Landeswetterdienst, Jahresbericht mit Abhandlungen*, **1949.** p. 73–81. figs., tables, 2 refs. **DWB**—The author discusses the principles underlying the construction of an apparatus for measuring unequal sky brightness, and the type of photoelectric cell required and gives diagrams of the instrument and of its wiring. Measurements of cloudiness obtained with this device are given and it is concluded that seven degrees of cloudiness can be determined easily. *Subject Headings:* **1. Sky brightness instruments 2. Photoelectric cells 3. Cloudiness 4. Cloud meters.**—*I.L.D.*

4.4–61 551.508.94:551.594.12

Schaffhauser, J., **Messung von kurzperiodigen Schwankungen der Luftionisation.** [Measurement of short-period variations of air ionization.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):179–186, **1952.** 5 figs., 4 refs. German, English, French summaries p. 179–180. **DWB**—An improved apparatus for measuring fine structure of space charge is described. It consists of an aspiration condenser, electrometer with amplifier and a quick response galvanometer. The sensitivity is so high that decay of single emanation atoms can be observed. By duplicating apparatus, records of + and − ions can be obtained simultaneously. Examples of records are shown. *Subject Headings:* **1. Atmospheric electricity instruments 2. Ionization.**—*C.E.P.B.*

4.4–62 551.508.96

Bibl, Klaus (*Military Ionospheric Forecasting Service, France*), **Un nouveau sondeur ionosphérique.** [A new ionospheric sonde.] *Annales de Géophysique*, Paris, 7(4):265–267, **1951.** 2 figs., 7 refs. **MH-BH**—A recently developed ionospheric sonde with a common oscillator for emitter and receiver is described and illustrated on schematic diagrams. The apparatus, based on conservative principles, is claimed to eliminate difficulties encountered in more complex instruments such as the Berkner-Wells and the Sulzer sondes. *Subject Heading:* **Ionospheric sondes.**—*G.T.*

4.4–63 551.508.96

Harnischmacher, E. (*Military Ionospheric Forecasting Service, France*), **Quelques améliorations du sondeur ionosphérique type Berkner-Wells-Seaton.** [A few improvements

on the Berkner-Wells-Seaton-type ionospheric sonde.] *Annales de Géophysique*, Paris 7(4):262–264, 1951. fig. **MH-BH**—The purpose of the modifications described in this pape is to secure conformity between the three circuits used in the Berkner-Wells-Seaton apparatus A circuit diagram of the instrument is presented and details of its operation given. *Subjec Heading:* **1. Ionospheric sondes.**—*G.T.*

## SYNOPTIC ANALYSIS AND FORECASTING

*See also:* **Machine predicts weather,** 4.4–28; **Method of working up aerological material** (Bartsch), 4.4–42; **20th century Magellans** (Behrens), 4.4–47; **Sutcliff's development theory and applications in synoptic practice** (Clauss), 4.4–107; **Barogram as weather forecaster** (Schmauss), 4.4–157; **Navigating the weather** (Allen), 4.4–168

4.4–64 551.509.3:551.515.1

§George, Joseph Johnson (*Eastern Air Lines, Inc.*), **The prediction of cyclogenesis** Eastern Air Lines, Inc., Contract AF19(122)-468, Short Range Forecasting Project, Repor No. 4, March 14, **1952.** 27 p. 33 figs., table. **DWB**—Prediction methods 12–24 hours i advance are proposed for the occurrence of cyclogenesis, the time and place of formation, it track and speed for 24 hours or more and the intensity of the resulting cyclone. The basi of the method is the recognition of cold air injection at the 850 mb level which takes place i a narrow current across the isotherms. Subjective experience is combined in this report wit objective relationships, a very useful approach. (Published form of *item* 3E–236, May 1952 *MAB.*) *Subject Headings:* **1. Cyclogenesis 2. Cyclone movement 3. Objective forecasting I. Eastern Air Lines, Inc., Meteorology Dept. II. Contract AF19(122)-468.**—*A.A.*

4.4–65 551.509.3:551.501.7(768

Holland, J. Z. (*Oak Ridge, Tenn.*), **Time-sections of the lowest 5000 feet.** *America Meteorological Society, Bulletin*, 33(1):1–6, Jan. **1952.** 6 figs. **MH-BH**—Data on synopti elements as obtained at Oak Ridge are presented on charts giving vertical cross-sections u to 5,000 ft of certain characteristic and instructive situations. Weather development con nected with the situations represented is described. The cross-sections are offered as example of the use of such charts in combining surface, tower, captive balloon, airplane, radiosonde an pilot-balloon observations. *Subject Headings:* **1. Synoptic studies 2. Cross sections 3. Tim sections 4. Oak Ridge, Tenn.**—*G.T.*

4.4–66 551.509.3:551.515.

Meeker, Ralph I., Jr. (*Amer. Airlines*), **A simple kinematic method for forecasting th motion of high level cyclones.** Jan. 20, **1952.** 27 p. 9 figs., 2 tables, 6 refs., 19 eqs. Mime ographed. **DWB**—The paper aims at anticipating the motion of high level cold lows b analyzing velocity distribution due to pairs of oppositely rotating circular vortices, with a je between them. The jet forecast method is based on selecting and combining these jets betwee vortex pairs to give the displacement of a low center or trough. Some examples of forecast at 500 mb and their verification are included. *Subject Heading:* **1. Forecasting cold lows.**— *C.E.P.B.*

4.4–67 551.509.31:551.510.535:551.594.

Gherzi, Ernest (*Macao Met. Ser.*), **A ionosfera eo tempo.** [Ionosphere and weather. **Aguaceiros em Macau durante a Monção de sudoeste.** [Showers at Macao during the soutl western monsoon.] *Macao. Serviço Meteorológico, Notas Científicas*, Nos. 3 and 4, 1952 2 pieces. In English and Portugese. **DWB**—In contrast to a number of bad forecasts mad in 1949–51 by Far East weather services, the author maintains that his method (first use in 1939) of predicting weather from the height of the ionospheric layer which reflects pulse (6 Mc) would have given correct forecasts every time. If the reflecting layer is at 230–280 km then Siberian (polar continental) air is expected for 12 hours, and if it is an F layer at $\geq 30$ km, then a tropical air mass is expected. If a typhoon is about 400 km from Macao it wi not reach station if echo is from 230–280 km, but will from >300 km region. *Subjec Headings:* **1. Synoptic forecasting 2. Ionospheric reflection.**—*M.R.*

4.4–68 551.509.317:551.515.127:551.54

George, Joseph J., Roche, Robert O.; Visscher, Hubert B.; Shafer, Robert J. and Biggers, William R., **On the relationship between fields of atmospheric pressure and temperature at upper levels and the behavior of surface pressure systems.** Eastern Airlines, Inc., Contract AF 19(122)-468, Report No. 3, Dec. 15, **1951.** 48 p. 23 figs., 11 tables, 7 eqs. **DWB**—An attempt is made to improve forecast methods for tracks of Lows under southwest flow by checking previous objective analyses against independent data. Also speed of movement of upper troughs has been introduced as a refinement. Deepening and filling of cyclones moving from northwest, and movement of anticylcones are also subjected to this method of analysis by testing against independent data. Illustrative charts and composite graphs which may be used in actual forecasting, together with comments on use, are included. *Subject Headings:* **1. Objective forecasting 2. Cyclone movement 3. Cyclogenesis 4. Anticyclone movement 5. Eastern United States. I. Contract AF 19(122)-468 II. Eastern Airlines, Inc., Meteorological Dept.**—*M.R.*

4.4–69 551.509.317:551.501.7:551.513

Okuta, Y., **Character of 700 mb chart in this summer.** *Journal of Meteorological Research,* Tokyo, 3(9):327–331, July **1951.** 6 figs. In Japanese. **DWB**—Monthly mean 700 mb chart from July 15–Aug. 18, 1950 shown for Asia and for America and changes in zonal index for 1950 compared with 1949 for various sectors of Northern Hemisphere. Anomalous conditions discussed in Japanese. *Subject Headings:* **1. Monthly mean upper air charts 2. Zonal index 3. Far East.**—*M.R.*

4.4–70 551.509.317

§Piper, Horst, **Eine bewährte Methode zur Konstruktion der Vorhersagekarte in 500 mb.** [A tested method for the construction of prebaratic charts at 500 mb.] *Meteorologische Rundschau,* 5(5–6):90–93, May–June, **1952.** 6 figs. **MH-BH**—The changes in relative topography 1000–500 mb are divided into advective and non-advective. The advective part is readily calculated from solenoids of a chart of existing relative topography and surface pressure. The non-advective part is more difficult but forecasting rules are given, exemplified by charts for 6–7 Dec. 1951. *Subject Headings:* **1. Upper air analysis 2. Prebaratic charts.**—*C.E.P.B.*

4.4–71 551.509.33:551.577.32(54)

Banerji, Sudhansu K., **Methods of foreshadowing monsoon rainfall and winter rainfall in India.** *India. Central Board of Irrigation, Journal,* 7(6):643–651, Nov. **1950.** tables. **DWB**—Report on the Indian Meteorological Department's long range forecasts of precipitation covering periods of 2–4 months. The forecasts are based on "Walker's test" in which 28 factors, partly extra-Indian, are considered and applied to 5 forecasting formulae. India's rainfall conditions and various facts connected with the application of forecasting methods are shown in tables and in conclusive explanations. *Subject Headings:* **1. Precipitation forecasting 2. Long range forecasting 3. Monsoon rains 4. India. Meteorological Dept. 5. India.**—*G.T.*

4.4–72 551.509.33:63(09)

Hesse, W., **Langfristige Witterungsvorhersage für die Landwirtschaft vor 800 Jahren?** [Long-range forecasts for agriculture 800 years ago?] *Angewandte Meteorologie,* 1(5):136–317, May **1952.** 8 refs. **DWB**—In a temple in Denmark about 1168 a statue of a god held a great horn. Each year at the harvest festival this was filled with mead. If this dried up a poor harvest was forecast; if it remained full, a good harvest. *Subject Headings:* **1. Weather lore 2. Long range forecasting.**—*C.E.P.B.*

4.4–73 551.509.6:06(47)

**Velikie stroĭki kommunizma i zadachi gidrometsluzhby.** [The great projects of communism and the aims of the Hydrometeorological Service.] *Meteorologiia i Gidrologiia,* No. 2:3–9, Oct. **1951. DLC**—Grandiose projects for the transformation of nature are being carried out at the present time in the Soviet Union. The most important of them are the building of the Kuibyshev, Stalingrad and Kakhovka hydroelectric stations and southern

Ukrainian, Northern Crimean and Turkmenian canals. To prevent drought damage, trees for protective belts were planted on more than 1,300,000 hectares of land during the last two years. The hydroelectric stations of the Volga region will be able to utilize about 80% of the entire water power resources of this area. The rated capacity of the Kuibyshev and Stalingrad hydroelectric stations is established as twenty million kw/h, i.e., more than half the amount of all electric power stations of the U.S.S.R. in 1938. The reclamation measures are very important for changing the climatic conditions of the U.S.S.R. (increase of precipitation, cloudiness and a decrease of solar radiation and temperature). *Subject Headings:* **1. Reclamation 2. Hydrometeorological services 3. U.S.S.R.**—*N.T.Z.*

4.4–74 551.509.62:551.578.46:656

Chapman, William P., **Design of snow melting systems.** *Heating and Ventilating* 49(4):96–102, April **1952.** 7 figs., 11 refs., eqs. **DWB**—This article explains and illustrates the importance of including so-called consequent energy losses in calculations for the design of a snow melting system. Very often these losses, such as vaporization and convection losses are considered insignificant and are ignored. It is shown here, however, that these terms are always significant, and should never be ignored. *Subject Headings:* **1. Snow melting systems 2. Artificial influences 3. Snow removal.**—*Author's abstract.*

4.4–75 551.509.62:551.521.32

**Coal dust absorbs solar heat.** *Heating and Ventilating,* 49(9):86, Sept. **1952.** fig. **DLC**—Brief note on experiments conducted by Dr. Basil M. Bensin at the Agricultural Experiment Station, College, Alaska. Coal dust was spread out and by absorbing solar heat speeded up the melting snow, warmed up the soil and created convection currents of heated air near the soil's surface. Amount of coal dust needed is 2 lb per square yard surface or 1000 lb per acre. Airplanes or helicopters can be used to distribute the dust over large areas. The use of the method is of particular interest in areas, like Alaska, where the growing season is short. *Subject Headings:* **1. Snow melt 2. Artificial influences 3. Absorption of terrestrial radiation 4. Coal dust absorption 5. College, Alaska. I. Bensin, Basil M.**—*G.T.*

4.4–76 551.509.62:551.578.46:656

*McKinley, J. L. (*Public Service Co. of Colo., Denver*), **Snow melting system practice and design.** *Heating and Ventilating,* 49(8):85–86, Aug. **1952.** fig. **DWB**—In this abstract of a paper presented at the National District Heating Association's 1952 annual meeting, present snow melting practices are reviewed and problems connected with snow melting system design discussed. Data on precipitation, temperature, wind speed, sunshine, relative humidity and cumulative depth and density of snow are presented in graphical form for a snowfall which occurred at Denver, Colo., on Nov. 2, 3 and 4, 1946 during a 70-hour storm. *Subject Headings:* **1. Snow melting systems 2. Climatic data 3. Denver, Colo.**—*G.T.*

4.4–77 551.509.62:631.54

Weger, N., **Ertragssteigerung bei Nutzpflanzen durch künstliche Veränderung des Bestandsklimas.** [Increasing the yield of food plants by artificial change of climate.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 32:38–41, **1952.** 3 figs., 2 tables. **DWB**—Fruit plants in front of white walls give earlier and higher yields than in front of black walls. Covering the soil with bright materials also increases the yield. *Subject Headings:* **1. Artificial climates 2. Plant forcing 3. Radiation effects 4. Germany.**—*A.A.*

## WEATHER CONTROL

4.4–78 551.509.67:344(794)

**Artificial rainmaking experiments continue over ever-widening areas.** *Engineering News-Record,* 147(14):46, Oct. 4, **1951. DLC, DWB**—Brief news article mentioning new laws for regulating rainmaking in California and appropriations for experiments in California and the Columbia Basin. *Subject Headings:* **1. Artificial precipitation 2. Cloud seeding 3. Western United States.**—*M.R.*

4.4–79 551.509.67

Orr, John L. (*Low Temperature Lab., Ottawa*), **Canadian experiments on induced precipitation.** *United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, N. Y.* 1949, *Proceedings*, v. 4, Water Resources, p. 27–36, **1951.** 7 figs., 9 tables, 13 refs. **DWB**—Fifty nine trials have been made using dry ice. In most cases the structure of clouds was altered, in many cases precipitation produced, and under certain conditions clouds generated. In 23% of all cases and in 43% of cases with supercooled clouds precipitation reached the ground. *Subject Headings:* **1. Artificial precipitation 2. Cloud seeding 3. Dry ice 4. Canada.**—*A.A.*

4.4–80 551.509.67(94)

**Rainmaking in Australia.** *Research*, London, 4(11):526, Nov. **1951. DLC**—This note refers to AgI cloud seeding experiments which are being carried out by the C.S.I.R.O. in the Riverina district of New South Wales. It is pointed out that earlier experiments throughout the world have not yet proved the usefulness of artificial rainmaking and that it will take some time before sufficient data can be collected in present experiments to serve as such proof. *Subject Headings:* **1. Cloud seeding 2. Silver iodide 3. Australia.**—*G.T.*

4.4–81 551.501.45:551.578:551.509.67

Resnick, Sol D. (*Colo. Agr. Exp. Sta. Ft. Collins, Colo.*), **Analysis of climatological data for the spring cloud-seeding period over North Central Colorado.** *Colorado Agricultural Research Foundation, Fort Collins, Preliminary Report*, July **1951.** 11 p. **DWB**—A statistical study was made of precipitation over the target area and a central area (1911–1951), snow pack over target and control area (1938–51) and the general rainfall pattern over the area west of the Mississippi. Results indicate that on control area 62% of normal precipitation occurred, whereas on target area, only 52% of normal (March) fell. Snow water content in central area in March and April 1951 was 147%, and on target area 158% of 13 year normal. Snow pack increase is attributed to low temperatures. No improvement was seen, either in comparison with normal, or with other areas of the west, as a result of seeding operations. *Subject Headings:* **1. Precipitation data analysis 2. Artificial precipitation 3. Cloud seeding. I. Colorado Agricultural Experiment Station, Fort Collins II. Northern Colorado Natural Resources Association.**—*M.R.*

4.4–82 551.509.67

Schaefer, Vincent J. (*Gen. Elec. Lab., Schenectady, N. Y.*), **Economic aspects of experimental meteorology.** *United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, N. Y. 1949, Proceedings*, v. 4, Water resources, p. 2–27, **1951.** 23 figs., 29 refs. **DWB**—A carefully prepared report with numerous photographs showing some effects of cloud seeding mostly with dry ice. A general review is given about nuclei and the atmosphere, causes of natural precipitation, fundamental experiments in cloud physics and requirements for cloud seeding. A diagram shows the temperature dependence for ice nuclei of different natural substances which may occur as aerosols in the atmosphere. The greatest activity occurs with $CO_2$ at 0°C or lower and, in less degree, AgI, which obtains full activity at −10°C. *Subject Headings:* **1. Experimental meteorology 2. Cloud seeding 3. Condensation nuclei.**—*A.A.*

4.4–83 551.509.67:551.582.1(459.1)

†Serra, Antonio, **La provocazione artificale delle precipitazioni e sua possibilità di applicazione in Sardegna.** [Artificial inducement of precipitation and its possible application in Sardinia.] *Rivista di Meteorologia Aeronautica*, 11(3/4):3–17, July–Dec. **1951.** 3 figs., 2 tables, 40 refs. Italian, French, English and German summaries p. 3. **MH-BH**—The article begins with an extensive review of early attempts at artificial production of precipitation and studies of cloud physics, and progress in this field of applied meteorology since 1946. Laboratory and field experiments in the U.S.A., Canada, Hawaii, France, Australia and South Africa are also reviewed and evaluated. The second part of the article deals with general climatic conditions in Sardinia, orographic influences, prevailing air flow, and frequencies of winds of various speeds from different directions in several parts of the island in relation to

rainfall, and, finally, the implications for experiments in artificial rain production. *Subject Headings:* **1. Artificial precipitation 2. Wind variations 3. Rainfall variations 4. Climate of Sardinia 5. Sardinia.**—*M.R.*

4.4–84 551.509.67

U. S. Weather Bureau. Scientific Services Division, **Evaluation of Dr. Langmuir's claims of producing weekly cycles in weather by cloud seeding.** June 6, 1952. 3 p. 2 refs. Mimeographed. **DWB**—A brief official statement of the U. S. Weather Bureau. LANGMUIR's claims were examined in detail with negative results. *Subject Headings:* **1. Cloud seeding 2. Periodicities 3. Langmuir, Irving.**—*A.A.*

4.4–85 551.509.67

Wendt, Gerald, **Coaxing rain out of the clouds.** *United Nations Educational, Scientific and Cultural Organization, Courier*, 5(7):10, July **1952.** illus. **DWB**—The forces contributing to the formation of precipitation, such as heat of evaporation, large-scale circulation, and cooling of large air masses, are described and found to be beyond present means of human control. The author, accordingly, believes that "the problems of getting water to the extremely arid deserts are not likely to be solved by rainmaking." The amount of vaporization-heat for the volume of water required for a rain one inch deep over a square mile is estimated as equivalent to that obtained by firing 6400 tons of coal. *Subject Headings:* **1. Artificial precipitation 2. Heat of vaporization.**—*G.T.*

## STRUCTURE AND PHYSICS OF THE ATMOSPHERE

### UPPER ATMOSPHERE-IONOSPHERE

*See also:* **Water vapor in upper air** (Dobson and Brewer), 4.4–5; **Instruments for pollution measurement** (Hemeon), 4.4–53; **Ionosphere and weather** (Gherzi), 4.4–67; **Annual variation of sodium D in nightglow** (Roach and Pettit), 4.4–135; **Relation: max. wind—tropopause level, during strong wind** (Austin), 4.4–174; **Cloud in stratosphere** (Farquharson), 4.4–194; **Disturbance of atmos. potential gradient by eruption smoke of volcano Aso** (Hatakeyama), 4.4–269

4.4–86 551.510.53

Moses, H. E. (*New York Univ.*) and Wu, Ta-you, (*Ottawa, Canada*), **A self-consistent calculation of the dissociation of oxygen in the upper atmosphere.** *Physical Review, 2nd Ser.*, 87(4):628–632, Aug. 15, **1952.** 4 figs., eqs. **DLC**—In a previous paper a self-consistent model was set up for the dissociation of oxygen in the upper atmosphere under the assumption of number balance and radiative energy balance and a form of the barometric equation. In the present paper a similar model is used, but the requirement of radiative energy balance is dropped and a temperature distribution is assumed. The resulting calculations indicate that for this model the dissociation region is much narrower than in the previous model and that it occurs at lower altitudes. *Subject Headings:* **1. Dissociation 2. Upper atmosphere.**—*Author's abstract.*

4.4–87 551.510.53:629.13:546.3

Teed, P. L. (*Aero. Res. and Devt. Vickers-Armstrongs*), **Stratospheric flight and metallurgy.** *Aeroplane*, London, 82(2122):334–335, March 21, **1952.** 5 figs. **DWB**—General data on temperature, density and humidity in the stratosphere are given. Metallurgical problems of stratospheric aircraft design are discussed. *Subject Headings:* **1. Stratosphere 2. Metallurgy.**—*G.T.*

4.4–88 551.510.53:551.507.362:551.590.25

Whipple, Fred L. (*Harvard College Observatory, Cambridge, Mass.*), **Results of rocket and meteor research.** *American Meteorological Society, Bulletin*, 33(1):13–25, Jan. **1952.** 5 figs., 3 append. **MH-BH**—In this review of recent rocket sounding and photographic observation of meteors, unpublished data on pressure, density and temperature in the upper atmosphere, on composition of the upper atmosphere, on radiation (solar constant, solar ultraviolet and

olar X-rays), on ionization and magnetic effects and on possible effects of meteors and micro-neteorites are presented and discussed. Data are classified into 3 "weight classes" according o their considered reliability. Pressure, temperature and density curves are constructed up o an altitude of 130 km. *Subject Headings:* **1. Upper atmosphere research 2. Rocket sound-ngs 3. Meteor research 4. Upper air data 5. Ionization 6. Magnetic effects.**—*G.T.*

4.4–89 551.510.534:551.506.7(09)(4)

Dobson, G. M. B., **Ozone.** *International Union of Geodesy and Geophysics, Association of Meteorology, Oslo, 1948, Procès-verbaux*, 3:138–142, Nov. **1950.** In English. **DWB**—Discusses ozone survey projected in 1936 by the I.U.G.G. but interrupted by the war. Nine-een ozone spectrometers were checked and calibrated at Oxford in 1937–39, and distributed o European stations. Results were obtained for Lerwick, Aberdeen, Eskdalemuir, Oxford nd Valentia. Results of studies made of ozone changes at fronts, in thunderstorms, annual ariation, vertical distribution and improvement in instrumental techniques. Future work utlined is reported. Ozone content falls ahead of warm front and rises after cold front pas-ages, rises during thunderstorms, and is highest in spring and lowest in Dec. *Subject Headings:* **1. Ozone research 2. Ozone networks 3. Ozone variations 4. Ozonometers 5. Europe.**—*M.R.*

4.4–90 551.510.534:551.521.61

†Filler, Aaron S., **Structure of the 9.6 micron band of ozone.** Utah. University. Dept. of Physics, Contract AF 19(122)-392, Stratospheric radiation, Technical Report, No. 2, Oct. 15, **1951.** 68 p. 4 tables, 23 figs., 33 refs., eqs. **DWB**—After a detailed analysis of tri-atomic molecules and their spectral properties, the author presents experimental data of the infrared spectrum of ozone and offers suggestions for determining the structure of the ozone molecule. It is found that no assignment of band types can be made for the entire infrared spectrum of ozone which would be consistent with all experimental data. An assignment for the 9.6$\mu$ band (representing the main contribution of ozone to the infrared transfer in the stratosphere) is therefore made independently. A table of Adel's measurements of frequencies of the peak of the $P$ branch as compared to calculated frequencies of the $P$ and $R$ branches, and a table of calculated line frequencies and intensities are presented and discussed. The paper includes ample reference to research reported in recent literature. *Subject Headings:* **1. Infrared spectrum of ozone 2. Ozone molecule structure 3. Ozone absorption. I. Utah. University. Dept. of Physics II. Contract AF 19(122)-392.**—*G.T.*

4.4–91 551.510.535

Ardillon, Jeanne-Marie, **Influence de l'heure locale dans les perturbations ionosphériques.** [Influence of local time upon ionospheric disturbances.] *Académie des Sciences, Paris, Comptes Rendus*, 234(15):1568–1571, April 7, **1952.** **DLC**—The daily variation of the critical frequencies along the vertical in the F2 layer at Poitiers and Washington was investigated for two years. Drops in frequency were observed between 18 and 24 h and around 6 h at Poitiers and between 22 and 6 h at Washington. It was found that two minima from 6 to 18 h enclose a diurnal maximum. The daily variations in amplitude were more marked during the equi-noxes than during any other time of the year. *Subject Headings:* **1. Ionospheric disturbances 2. Diurnal variations 3. F2 layer.**—*I.L.D.*

4.4–92 551.510.535:621.396.11

Banerjee, S. S. and Mehrotra, R. R. (*Benares Hindu Univ.*), **Equivalent paths of the extraordinary waves for oblique incidence at the ionosphere.** *Journal of Scientific and Industrial Research*, New Delhi, 11B(6):216–218, July **1952.** figs., 3 refs., 10 eqs. **DWB**—Presents the method of deriving an equation useful for drawing the curves of the extraordinary wave, explaining the formation and features of the fading pattern observed near the maximum usable frequency (m.u.f.). *Subject Headings:* **1. Ionosphere 2. Radio wave propagation.**—*W. N.*

4.4–93 551.510.535:523.78

Banerjee, S. S., Rajan, V. D. and Banerjee, P. C. (*Benares Hindu Univ.*), **Some observations on the effect of solar eclipse on the $F_2$ region of the ionosphere.** *Journal of Scientific and*

*Industrial Research*, New Delhi, 11B(5):197–198, May **1952.** fig., 7 refs. **DWB**—An analysi of observations made with short wave radio signals both at the vertical and oblique incidenc during the solar eclipse at Benares on Feb. 28, 1952 in order to determine the source of ioniza tion in the F2 region. Evidence is presented indicating the possibility that the ionization i the F2 region observed during the eclipse is due to neutral particles emitted by the sun. *Sub ject Headings:* **1. Ionosphere 2. F2 layer 3. India.**—*I.L.D.*

4.4–94 551.510.535:551.594.

*Banerji, R. B., **Studies on the sporadic E-layer.** *Indian Journal of Physics*, 25(8):359 374, Aug. **1951.** 6 figs., table, 11 refs., 13 eqs. **DLC**—This investigation shows that: 1) th echo of a transmitted radio signal consists of one component due to random scattering an another component due to steady reflection, hence 2) the E-region consists of one ion-clou region and one regularly reflecting region. A method for estimation of the average numbe density of electrons in the cloud shows the number density to be below that required for tota reflection of the transmitted wave. An advanced formula that can be applied to investi gations of the structure of that part of the E-region that gives rise to the steady echo is dis cussed. *Subject Headings:* **1. Ionosphere 2. Sporadic E layer 3. Electron density 4. Micro wave propagation.**—*W. N.*

4.4–95 551.510.535(99

Barré, M. and Rawer, K., **Quelques résultats d'observation ionosphériques effectuée près de la Terre Adélie.** [Some results of ionospheric observations made near Adélie Land.] *Journal of Atmospheric and Terrestrial Physics*, 1(5/6):311–314, **1951.** fig., 3 refs. **DWB**— The ionospheric observations in this region show many anomalies due to the proximity of th magnetic pole. The E, F, and $F_2$ echoes are often scattered, especially the $F_2$ echoes, due t ionic clouds at the E level. Characteristic photographs are added. *Subject Headings:* **1. Iono spheric observations 2. Adélie Land, Antarctica.**—*A.A.*

4.4–96 551.510.535:621.396

Bennington, T. W., **Short-wave radio and the ionosphere. With special reference t everyday professional and amateur problems of short-wave transmission and reception** 2nd ed. Wireless World, Iliffe and Sons, **1950.** 138 p. 57 figs., 2 photos. **GB-MO**—Whil this book deals mainly with the theory of radio transmission it has considerable interest fo meteorologists, including accounts of the formation and structure of the ionosphere, th technique of ionospheric measurements, regular and anomalous variations of height and ioniza tion, radio noise and ionospheric storms, with relevant curves and world charts. *Subject Headings:* **1. Ionospheric structure 2. Radio wave propagation.**—*C.E.P.B.*

4.4–97 551.510.535

Berkner, L. V. (*Carnegie Inst. of Wash.*), **Signposts to future ionospheric research.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 12:13–20, **1952. DWB**—A survey of the progress in ionospheric research beginning with GAUSS a century ago furthered by discoveries of MAXWELL and MARCONI and later by CHAPMAN, APPLETON, TUVE and others. The concept of the atmosphere as a series of heat engines, developed by WULF, is extended to include the F region as a fourth heat engine. Future efforts should be along the lines of investigating chemical and photochemical problems, thermo-dynamic processes, atmospheric movements, auroral physics, radio astronomy, and evolution of the earth's atmosphere (and consequent evolution of life on earth). *Subject Headings:* **1. Iono spheric research 2. Upper atmosphere research.**—*M.R.*

4.4–98 551.510.535:551.594.12:551.590.21

Bibl, Klaus (*Military Ionospheric Forecasting Service, France*), **L'ionisation de la couche E, sa mesure et sa relation avec les éruptions solaires.** [Ionization of the E layer, its measure ment and correlation with solar eruptions.] *Annales de Géophysique*, Paris, 7(4):208–214, **1951.** 3 figs., table, 12 refs. French and English summaries p. 208. **MH-BH**—Owing to the technical development of the last few years brief delay in signals (caused by thin layers) can now be measured and a revision of the definition of "normal" layers has therefore become

necessary. The author discriminates between normal "parabolic" layers and thin abnormal layers (which have an ionization curve with a much stronger vertical gradient). A definition of the critical frequency $f_0E$ is given. Applying his classification to ionospheric observations made at Freiburg during three summer months of 1950 and 1951, the author finds that by using his method the amount of fluctuation in the daily variation and of the monthly scattering is considerably reduced. All values of more than 0.2 MHz above median are found to be connected with SID-effects. Ionograms showing the development of an intermediate layer and of an SID, sketches of typical ionograms and a table giving departures from monthly median values of recorded intensities of $f_0E$ and their correlation with SID are presented. *Subject Headings:* **1. Ionization measurements 2. E layer 3. Solar eruptions 4. Ionospheric layers 5. Ionograms.**—*G.T.*

4.4–99 551.510.535:621.396

Bibl, Klaus, Rawer, Karl and Theissen, E., **An improved method for the calculation of the field-strength of waves reflected by the ionosphere.** *Nature*, London, 169(4291):147–148, 26 Jan. **1952.** 2 figs., 5 refs., eqs. **DWB**—Sets out a method of calculating photometric attenuation, nonselective D-absorption and selective absorption. *Subject Heading:* **1. Radio wave propagation.**—*C.E.P.B.*

4.4–100 551.510.536:621.396

Budden, K. G. and Yates, G. G., **A search for radio echoes of long delay.** *Journal of Atmospheric and Terrestrial Physics*, 2(5):272–281, **1952.** 23 refs. **DWB**—An unsuccessful search was made for echoes delayed 3–15 sec. The cause of such echoes is discussed and they are tentatively attributed to "the propagation of guided waves over long curved paths formed by belts of ions outside the earth but fixed relative to it." *Subject Headings:* **1. Exosphere 2. Reflection echoes.**—*C.E.P.B.*

4.4–101 551.510.536

Buettner, Konrad J. K. and Haber, Heinz (*Dept. of Engineering, Univ. of Calif., Los Angeles*), **The aeropause.** *Science*, 115(2998):656–657, June 13, **1952.** **DWB**—The limits of the atmosphere from 16 km to 200 km above sea level are classified according to the particular kind of function the atmosphere fulfills for man and craft. The various functions with their corresponding height limits are listed. The author coins the term "aeropause" to designate "the regions of the atmosphere where—in terms of manned rocket flight—the conditions of conventional aviation blend into those of actual space flight." *Subject Heading:* **1. Aeropause.** —*I.L.D.*

## MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

*See also:* **Angular momentum transfer and vorticity transfer methods in field of cyclonic or anticyclonic wind system** (Arakawa), **4.4–109**

4.4–102 551.511:523.74:538.1

Alfvén, Hannes (*Royal Inst. of Tech., Sweden*), **Electricity in space.** *Scientific American*, 186(5):26–29, May **1952.** 5 figs. **DWB**—The author describes an experiment in which he claims to have produced a magneto-hydrodynamic wave for the first time, by applying a vertical magnetic field to a tank containing mercury and applying a circular motion to the bottom of the liquid. The motion was immediately communicated to the top. This rising wave of motion, according to author, produces mechanical motion, a magnetic field and an electric field. The principle of magneto-hydrodynamic waves is applied to various phenomena in the sun and in space. The formation of sunspots and solar prominences is described in terms of such waves resulting from energetic nuclear reactions in the interior of the sun. The great energy of cosmic rays is explained by the existence of magnetic fields in space. Photographs of sunspots and solar prominences are presented. *Subject Headings:* **1. Magneto-hydrodynamic waves 2. Sunspots 3. Solar physics 4. Electromagnetism.**—*G.T.*

4.4–103 551.511

Gordon, Adrian Hugo, **Mean seasonal resilience of the atmosphere around the British Isles 1948–50.** *Meteorological Magazine*, London, 81(965):333–335, Nov. **1952.** fig., 4 refs. **MH-BH**—Resilience (=negative lability from tephigram) is energy available to restore original position if air is displaced vertically. Seasonal values for JIG, ITEM, Lerwick and Larkhill are computed for 1000–700 mb level (joules/gm). *Subject Heading:* **1. Stability.**—*C.E.P.B.*

4.4–104 551.511:532.5

Otani, T., Kanzai, S., Fujiwhara, Sakuhei and Syono, S., **On the behaviour of two couples vortices and velocity distribution within them.** *Geophysical Magazine*, Tokyo, 22(4):289–310, Aug., **1951.** 15 figs., 7 plates, eqs. **MH-BH**—Experiments are made to determine the forces acting between two revolving columns of water. A simple theory is given. In the stationary state there is an attraction between two water vortexes with different sense of rotation and a repulsion between those with the same sense of rotation (observed in five out of seven cases). On the other hand sometimes an amalgamation phenomenon is observed between two vortexes of the same sense. In that process the two vortexes with the same sense of rotation approach each other. *Subject Headings:* **1. Vortexes 2. Experimental hydrodynamics.**—*A.A.*

4.4–105 551.515.11:551.511

Sherman, Leon, **A kinematic relationship in the field of motion in storms.** *American Geophysical Union, Transactions*, 32(6):849–852, Dec. **1951.** 5 figs., 4 refs. **MH-BH**—Author suggests and illustrates a kinematic rule that quickly estimates the direction of the basic current of a disturbance. The applicability of this rule may be determined from the synoptic chart if the disturbances satisfy the following criteria: 1) the critical points must be joined, and 2) the cyclones must possess angular symmetry with respect to isogon distribution. *Subject Headings:* **1. Cyclonic motions 2. Kinematics of wind fields.**—*W. N.*

4.4–106 551.511:551.557.3

Wippermann, F. (*Mainz*), **Die Konfiguration mittlerer Höhenströmungsfelder und ihre Ursachen.** [The configuration of the mean field of atmospheric motion and its origin.] *Tellus*, 4(2):112–117, May **1952.** fig., 7 refs., 11 eqs. English summary p. 112. **MH-BH**—Some computations are presented in order to estimate the relative importance of different factors for the generation of the quasi-stationary perturbations in the westerlies, such as the effect of the large mountain barriers, the heat exchange with the surface of the earth and surface friction. For that purpose the vorticity advection of the mean field of motion has been computed. It is concluded that the three factors mentioned seem to be of the same order of magnitude. *Subject Headings:* **1. Waves in the westerlies 2. Atmospheric circulation.**—*Author's abstract.*

4.4–107 551.511:551.509.312

§Clauss, J., **Sutcliffes Entwicklungstheorie und einige Anwendungen in der synoptischen Praxis.** [Sutcliffe's development theory and some applications in synoptic practice.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:26–35, **1952.** 23 figs., 8 refs., eqs. **DWB**—SUTCLIFFE's diagnostic criterion for cyclo- and anticyclonic development, under certain assumptions, is a useful aid in practical synoptics. This is shown by European examples for March 1–5, 19–24 and March 28–April 3, 1952. *Subject Headings:* **1. Differential kinematics 2. Convergence 3. Divergence.**—*C.E.P.B.*

## GENERAL CIRCULATION

*See also:* **Experimental analogies to atmos. motions** (Fultz), 4.4–6; **Identification of tornadoes by wave from atmospherics** (Jones and Hess), 4.4–34; **700 mb charts, summer 1950** (Okuta), 4.4–69; **Flying the jet stream** (Blair), 4.4–175; **Feb. rainfall min. in Hawaii as manifestation of primary index-cycle of general circulation** (Namias and Mordy), 4.4–204

4.4–108 551.513:551.55

Arakawa, Hidetoshi, H., **Zonal wind-profile between the pole and the equator given by a single expression.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):129–135, 1952. fig., 11 refs., 8 eqs. English, German, French summaries p. 129-130. **DWB**—The expression for zonal velocity $\bar{u}$ is:

$$\frac{a\Omega \cos\phi(1-\sin\phi)}{1+\sin\phi}\left\{1-\frac{1}{7.5}(8+\sin\phi-6\sin^2\phi-3\sin^3\phi)\right\}$$

and for absolute vorticity, $2\Omega(1-\cos^4\phi)$, where $\Omega$ is angular velocity of earth's rotation and $\phi$ is latitude. The trends of the calculated curves fit the observations well. An appendix discusses a paper by A. ÅNGSTRÖM (1926) on energy transfer and mean temperature. *Subject Headings:* **1. Zonal circulation 2. Vorticity.**—*C.E.P.B.*

4.4–109 551.513.1:551.511

Arakawa, Hidetoshi, **Angular-momentum-transfer method and vorticity-transfer method in the field of circular cyclonic or anticyclonic wind system.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 29(11):388–393, Nov. **1951.** 2 refs., eqs. In Japanese. **MH-BH**—Comparative and critical studies of both methods are given. The ideas of the author on this important topic are also published in English (*Tellus*, 3, 1951). *Subject Headings:* **1. Atmospheric circulation 2. Vorticity 3. Angular momentum.**—*A.A.*

4.4–110 551.513.1

Shuleĭkin, V. V., **Sushchnost' kolebaniĭ obshcheatmosfernoĭ tsirkuliatsii.** [Nature of the oscillations of the general circulation.] *Akademiia Nauk SSSR, Doklady*, 83(2):211–214, **1952.** 15 eqs. **DLC**—The author describes a possible mechanism for the origin of undamped self initiated oscillations in the general circulation. Disregarding friction and assuming a purely zonal flow in the middle latitudes he expresses the increases ($\gamma$) in gradient $\Gamma_0$ in zonal flow by the linear relationship $\frac{\partial\gamma}{\partial t}=-\left(mu+p\frac{\partial u}{\partial t}+nv+g\frac{\partial v}{\partial t}\right)$ in which $v$=meridional velocity; $u$=zonal velocity. It is shown that by means of this equation and the hydrodynamic equations $\frac{\partial u}{\partial t}=2\bar{\omega}v$, and $\frac{\partial v}{\partial t}=-2\bar{\omega}u+\frac{\gamma}{\delta}$ it is possible to explain the origin of disturbances in the general circulation. *Subject Heading:* **1. Atmospheric circulation.**—*I.L.D.*

## ATMOSPHERIC DISTURBANCES

*See also:* **Prediction of cyclogenesis** (George), **4.4–64**; **Kinematic method for forecasting motion of high level cyclones** (Meeker), **4.4–66**; **Relation between atmos. pressure fields, upper level temp. and behavior of surface pressure systems** (George, Roche, etc.), **4.4–68**; **Size difference of sea waves in warm and cold air** (Roll), **4.4-173**; **Moisture accumulation rates in thunderstorm cells** (Weiss), **4.4–193**; **Effects of summer cold air pools on rainfall distribution, Sea of Marmara** (Weickmann), **4.4–202**; **Heavy rainfall accompanying tropical storm, Aug. 1948, Shikoku District** (Yoshino), **4.4–208**; **89 Mc/sec radio wave propagation in relation to synoptic conditions** (Spencer), **4.4–279**; **Relations between infra-long-wave disturbances and meteorological phenomena** (Reiter), **4.4–280**

4.4–111 551.515.11 551.515.71

James, R. W., **Some remarks on the thermodynamics of cyclones and anticyclones.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):136–157, **1952.** 6 refs., 21 eqs. English, German, French summaries p. 136–138. **DWB**—In stationary circular nearly geostrophic vortices the circulation is maintained against skin friction by heat sources and sinks, the distribution of which in the atmosphere is determined by radiation balance and precipitation. Radiation warming by 0.05 cal/cm²/min or rainfall of 1.1 mm/day would maintain a normal cyclone but not a hurricane. On monsoon, a sink density of 0.1 cal/cm²/min would maintain the Siberian anticyclone. Circulations are classified into hypothermal, in which strength decreases with height (surface sink or source, warm lows or cold highs) and

hyperthermal (mature lows or highs) and change from hypo- to hyperthermal (e.g., occlusion) discussed. On origin of vortices he concludes that a cyclonic circulation will develop in a heat source region, anticyclonic in a heat sink. *Subject Headings:* **1. Cyclogenesis 2. Anticyclogenesis.**—*C.E.P.B.*

4.4–112 551.515.3:551.556.1(776)

Hovde, M. R. (*U. S. Weather Bureau, Minneapolis, Minn.*), **The Hennepin County tornado of July 20, 1951.** *Weatherwise,* 5(3):60–62, June **1952.** 3 figs. **MH-BH**—The path of the tornado is described with the aid of a map and the damage and disruption that it caused are surveyed. The meteorological aspects of the storm are presented in detail. *Subject Headings:* **1. Tornado tracks 2. Tornado damage 3. Hennepin County, Minn.**—*I.L.D.*

4.4–113 551.515.3(767):551.579.4(762)

Ludlum, David M., **Floods and tornadoes mark early spring.** *Weatherwise,* 5(3):63–65, June **1952.** 3 figs. **MH-BH**—A description of the general weather situation in the United States during March 1952 is presented and the cause and damage of the Arkansas tornado and the meteorological aspects of the Missouri floods are discussed in detail. U. S. Weather Bureau charts of temperature and precipitation for March and April 1952 are reproduced. *Subject Headings:* **1. Floods 2. Tornadoes 3. Arkansas 4. Missouri.**—*I.L.D.*

4.4–114 551.515.33:551.515.23

Arakawa, H., **Phugoid motion of whirlwinds in the atmosphere.** *Geofisica Pura e Applicata,* 22(3/4):171–173, April/June **1952.** 3 figs., refs., eqs. **MH-BH**—The equations of motion are set up for the movement of a symmetrical whirlwind or hurricane (much simplified) and the integrations performed for the two cases (cyclonic and anticyclonic path). It is shown graphically that the motion will be trochoidal in either case. The actual path of a captive balloon (dragging a heavy mooring stone across country at Tateno-Observatory) when caught in a whirlwind is illustrated and it fits the theoretical path—very nicely. It is assumed that certain typhoons follow such a path, but because their deviation from the average path is small, the motion is merely oscillatory. *Subject Headings:* **1. Whirlwind movement 2. Typhoon tracks 3. Phugoid theory 4. Tateno-Observatory, Japan.**—*Author's abstract.*

4.4–115 551.515.4:523.74

Aniol, R., **Schwankungen der Gewitterhäufigkeit in Süddeutschland.** [Variations of thunder frequency in S. Germany.] *Meteorologische Rundschau,* 5(3/4):55–56, March/April **1952.** 2 figs., table, 9 refs. **DWB**—Recalculated annual thunderstorm frequencies in S. Germany 1881–1950 (mean of 6 stations) have a correlation with sunspot numbers of only −0.02 for the whole series, but −0.55 for 1889–1913 and +0.74 for 1923–44. This phase reversal is associated with a symmetry point in 1913–14 and periodicities of 8, 21 and 13 years. *Subject Headings:* **1. Thunderstorm frequencies 2. Sunspot effects 3. Germany.**—*C.E.P.B.*

4.4–116 551.515.4:551.594.221(492)

de Jong, J. J. G., **Het zware onweer van 6 en 7 Juli in Friesland.** [The severe storm of July 6 and 7 in Friesland.] *Hemel en Dampkring,* 50(7/8):136–137, **1952.** 2 figs. **MH-BH**—This storm was characterized by a very large number of lightning discharges although the rainfall was moderate. The synoptic situation during and before the electrical storm is described. The lightning discharges are described and maps showing places where lightning struck are presented. *Subject Headings:* **1. Lightning strokes 2. Thunderstorms 3. Friesland, Netherlands.**—*I.L.D.*

4.4–117 551.515.4 551.594.6

Holzer, R. E., **Thunderstorms and sferics.** (In: **Thunderstorm electricity.** Chicago, University, Dept. of Meteorology, Oct. **1950.** p. 217–229. 6 figs.) **DWB**—An attempt is made to correlate sferics records with direct observations of a distant sferics-producing thunderstorm. The observational and instrumental set-up used by the University of New Mexico, Albuquerque, are described. The characteristics of lightning strokes of known storm types (frontal and nonfrontal) and the types of sferics records associated with and without direct

torm observations are discussed. *Subject Headings:* **1. Thunderstorms 2. Sferics 3. Lightning.** *–I.L.D.*

4.4–118 551.515.4

Pisharoty, P. R. (*Safdarjung Aerodrome, Delhi*), **The thunderstorms.** *Aeronautical Society of India, New Delhi, Journal*, 3(3):49–79, Aug. **1951.** 25 figs., 12 tables, 5 refs. **DWB**—The author gives a detailed description of physical phenomena connected with thunderstorms at various stages of their development, as determined by the Thunderstorm Project which was conducted from 1945 to 1947 in Florida and Ohio under sponsorship of four U. S. Government agencies (Air Force, Navy, NACA and Weather Bureau). Data on updraft and downdraft speed and width frequency distribution, on gust velocities and on rain intensities during individual thunderstorms, and schematic cross sections are reproduced from the Thunderstorm Report of BYERS and BRAHAM. Suggestions of flight techniques applicable to thunderstorm conditions are offered. Maps illustrating the monthly frequency distribution of days with thunder and dust storms over India and surrounding areas throughout the year are presented and briefly commented on. *Subject Headings:* **1. Thunderstorms 2. Thunderstorm Project.**—*G.T.*

4.4–119 551.515.4:629.13

U. S. Weather Bureau, **Causes and characteristics of thunderstorms and other atmospheric disturbances. Fourth Interim Report.** Washington, D. C. **1952.** 24 p. 35 refs. Several pertinent reports and reprints included as appendices. **DWB**—Report to the Congress for Fiscal Year 1952. Contains research information about terminal and in-flight conditions, tornadoes and squall-lines, cloud physics, hurricanes and artificial control of weather. Special attention is turned to safety in aviation from the standpoint of weather. References are given to numerous papers published in connection with this project. Eleven papers are added in appendices, dealing with forecasting in aviation meteorology, radar observations, clear air turbulence, tornado forecasting, artificial clouds and cloud seeding (abstracted separately). *Subject Headings:* **1. Thunderstorms 2. Aeronautical meteorology.**—*A.A.*

4.4–120 551.515.41

Braham, Roscoe R., Jr., **The water and energy budgets of the thunderstorm and their relation to thunderstorm development.** *Journal of Meteorology*, 9(4):227–242, Aug. **1952.** 17 figs., 5 tables, 9 refs., 6 eqs. **DWB**—Using Thunderstorm Project data from Florida and Ohio, author discusses water sources and sinks, and flux of water vapor in a thunderstorm cell. He estimates vertical mass exchange in various ways. Total inflow averages $8.9\times10^8$ kg vapor, of which 5.3 is condensed. This is divided between rainfall 1 kg, evaporation from sides and residual cloud 1.9, reevaporated in downdraft 2.4. Energy budget and restratification are found from latent heat, entrainment and redistribution of energy within air mass; energy of lightning flashes to ground is negligible. The relation of water and energy budgets to convective development is discussed, using a nomogram to compute work done in lifting 1 kg of air through 100 m. *Subject Headings:* **1. Thunderstorm dynamics 2. Thunderstorm Project.**—*C.E.P.B.*

4.4–121 551.515.41:551.594.21

†Wichmann, Heinz, **Zur Theorie des Gewitters.** [On the theory of thunderstorm.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):187–230, **1952.** 17 figs., 48 refs. German, English and French summaries p. 187. **DWB**—Numerous studies of the electricity of precipitation and structure of thunderstorms, including author's own observations and the rich material from the Rhön glider competition during a thundery period in 1938, are summarized in this richly documented memoir. Theories of electrification and development of space charges are discussed at length. They fall into two contrasted groups: 1) that the fields of 100 V/cm develop so rapidly that equalizing forces have no time to act, and bursts of precipitation are due to the agitation of the droplets by thunder, 2) that the rain is the essential factor. Author tries to reconcile these views, but a thunderstorm is so big and complicated that further researches are required. *Subject Headings:* **1. Thunderstorm structure 2. Thunderstorm electricity.**—*C.E.P.B.*

4.4–122 551.515.42:551.57

Reichel, Eberhard (*German Weather Service, U. S. Zone*), **Die Starkniederschläge vom 15.–17. Juli in Südbayern.** [The heavy rains of July 15–17, 1951 in southern Bavaria.] Supplement to: **Witterungskurzbericht für Bayern, Juli 1951** and **Wetterkarte des Wetterdienstes München, 7.8.51.** [1951.] 2 p. Mimeographed. **DWB**—Heavy thunderstorm rainfall occurred in connection with a cold front. Greatest amount 147 mm at Grümbach Kr. Erding. Damage was great because ground was saturated. June rainfall had been 200–280% of normal in some sectors. *Subject Headings:* **1. Thunderstorm rainfall 2. Excessive rainfall 3. Bavaria.**—*G.T.*

4.4–123 551.515.427:551.507.352:551.558.1(771)

Byers, Horace R. (*Univ. of Chicago*), **An example of a flight through a thunderstorm updraft.** *American Meteorological Society, Bulletin*, 33(5):211–212, May **1952.** fig., ref. **MH BH**—A detailed description of a traverse made at an altitude of about 20,000 ft through a thunderstorm over Ohio. A diagrammatic representation of the flight showing temperature, altitude, air speed and the distribution of the weather elements is given. The airplane was in an updraft which was about 5°C warmer than the environmental air. The increase in air speed combined with the constant power setting at which the flight was maintained placed the airplane in a nosedown position. *Subject Headings:* **1. Airplane observations 2. Thunderclouds 3. Vertical currents 4. Thunderstorm flights 5. Ohio.**—*I.L.D.*

4.4–124 551.515.43:551.576.11:551.594.21

Schüepp, Max (*Zurich*), **Der Lebenslauf einer Gewitterwolke.** [Life history of a thundercloud.] *Leben und Umwelt*, Aarau, Switz., 7(10):231–236, July **1951.** 2 figs. **DWB**—A popular description of thundercloud development. The inhomogeneity of surface and anabatic flow of air during unstable atmospheric conditions cause well-developed thunderclouds. The formation of these clouds is accompanied by electrical charge in clouds. The author presents a sketch, which shows the distribution of positive and negative charges in the cloud and in rain falling from the cloud. *Subject Headings:* **1. Cumulonimbus formation 2. Thunderclouds 3. Thunderstorm electricity 4. Popular meteorology.**—*N.T.Z.*

## RADIATION AND TEMPERATURE

### RADIATION

*See also:* **Coal dust absorbs solar heat,** 4.4–75; **Structure of 9.6μ ozone band** (Filler), 4.4–90; **Short wave radiation phenomena** (Hund), 4.4–278

4.4–125 551.521:551.508.21(09)(438)

Gorczyński, Władysław, **O organizacji prac aktynometrycznych w Polsce.** [On the organization of actinometric works in Poland.] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:313–314, **1951. DWB**—A report on the actinometric work done in Poland from 1900 to the present, and plans for the future. *Subject Headings:* **1. Actinometry 2. Radiation measurement 3. History of actinometry 4. Poland.**—*W. Tomczykowski.*

4.4–126 551.521:551.501.1

Wegener, Kurt, **Die Sonnenstrahlung und ihre Messung.** [Solar radiation and its measurement.] *Geofisica Pura e Applicata*, 22(3/4):205–236, April/June **1952.** 6 figs., 3 tables. In German, English summary p. 205. **MH-BH**—History and results of a 4½-years-expedition to Argentina. A determination of the sun's "temperature" can only be given by the laws of Boltzmann-Stefan and Wien, because the temperature of the different layers is different. In the measurements of the sun's radiation the law of Boltzmann-Stefan was introduced ($\sigma T^4$, where $\sigma$ is a constant, and $T$ the Kelvin-Temperature) while in the past 100 years the difference between the sun's and the instruments' radiation was taken as radiation, although this difference was an arbitrary variable with the instruments' temperatures. The effect of the vertical exchange of air masses on the radiation of the sun and the radiation of the air between the sun and the instrument was cleared. With these corrections one can not

eceive more than the difference between the so called solar constant and the albedo of the tmosphere. If the highest values are used (smallest albedo) the approximated value of the olar constant becomes 2.4, corresponding well to the value derived from the supposed tem- erature of the sun. *Subject Headings:* **1. Solar radiation 2. Radiation measurement 3. Solar onstant 4. Solar temperature 5. Expeditions 6. Argentina.**—*Author's abstract.*

4.4–127 551.521.14:551.586:636

Cena, Mieczysław, **Przyczynki metodyczne do badań fotoklimatycznych w zakresie ioklimatologii weterynaryjnej.** [Contribution to a bioclimatic study of illumination for eterinary purposes.] *Przegląd Meteorologiczny i Hydrologiczny*, v. 1950/1951:33–41, **1951.** figs., 8 refs. English summary p. 41. **DWB**—A discussion of bioclimatic problems with egard to hygiene of domestic animals and their barns. A comparative method of determining he illumination of barns based on GEIGER's procedure and the author's method of measuring he absorption of solar radiation by the skin of domestic animals are presented and described. The result is obtained on basis of the animal skin albedo, which has the property of uniform eflection of diffused radiation. *Subject Headings:* **1. Radiation effects 2. Animal ecology . Skin albedo.**—*A.M.P.*

4.4–128 551.521.14:551.521.61

*Gates, David M. and Tantraporn, Wirojana (*Univ. of Denver, Colo.*), **The reflectivity of eciduous trees and herbaceous plants in the infrared to 25 microns.** *Science*, 995(2997):613–16, June 6, **1952.** 4 tables, 10 refs. **MH-BH**—Data are given for reflectivity of infrared adiation (3–25$\mu$) at 65° angle of incidence from 27 species of trees and shrubs, and for 20° ngle of incidence for 9. Ratio of reflectivity of upper to lower leaf surface is also shown, ndicating that the upper surface is from 1 to 10 times more reflective than the lower. The reatest value obtained was for the lemon leaf at 10$\mu$ and 65° angle (17% of mirror reflection). Waxy leaves are more reflective than nonwaxy. Mechanism of absorption and reflection n leaves is discussed. Based on work done in the Dept. of Physics at the Univ. of Denver, Colo. with a double beam Baird infrared spectrometer with a NaCl or KBr prism for 3–25$\mu$ neasurements. A Perkin-Elmer spectrometer with NaCl prism was used for 0.9–3.0$\mu$ data. [*See item* 3.3–131, March 1952, *MAB* for work by KRINOV on "Spectral reflectivity in 400–00Å (.04 to .09$\mu$) region."] *Subject Headings:* **1. Albedo of plants 2. Infrared radiation . Spectral reflectivity.**—*M.R.*

4.4–129 551.521.14:551.588.4

*Lauscher, Friedrich, **Sonnen- und Himmelsstrahlung im Meer und in Gewässern. I Teil: Theorie der Strahlungsreflexion.** [Sun and sky radiation in the sea and in waters. Pt. I, Theory of reflection of radiation.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):168–192, **1952.** 8 figs., 11 tables, 18 refs., 15 eqs. German, English and French ummaries p. 168–170. **DWB**—This theoretical study of the penetration of radiation into sea vater first derives tables for indexes of refraction and reflection of solar radiation falling on alm water at various angles. Refraction is related to temperature, wave length and salinity. From these data it is calculated that total reflection of solar radiation from a water-covered phere at equinox is 6.6%. Of radiation polarized normal to plane of incidence, 10.2% is eflected. Diurnal variation and daily sum of reflected radiation in different latitudes are alculated. Reflection of sky radiation also averages 6.6%. Of radiation from water out- vards, 48.3% is reflected back at inner surface. Reflection from sea bottom and from waves, nd effect of haze and cloud are also considered. *Subject Heading:* **1. Albedo of sea.**—*C.E.P.B.*

4.4–130 551.521.14

Middleton, W. E. Knowles, **Note on the reflection of diffuse daylight from still water.** Royal Meteorological Society, *Quarterly Journal*, 78(338):627–628, Oct. **1952.** 6 refs., 5 eqs. **DWB**—Calculated reflection of light from an overcast sky of uniform luminosity gives a eflecting power of 0.066. Author recalculates this for ratios of brightness zenith/horizon to 4 and finds that for the average ratio (3) the reflecting power is 0.51. *Subject Heading:* **. Albedo.**—*C.E.P.B.*

4.4–131 551.521.1

Middleton, W. E. Knowles and Mungall, A. G. (*Natl. Res Council of Canada*), **The luminous directional reflectance of snow.** *Optical Society of America, Journal*, 42(8):572–579 Aug. **1952.** 6 figs., 11 refs., eqs. **DWB**—By means of a specially constructed portabl goniophotometer, the directional reflectance of numerous surfaces of snow was measure during the winter of 1951–1952. While some samples reflected more nearly diffusely tha others, all showed much specular reflection at high angles of incidence. An approximat theory of the specular reflection is given and its results compared with experiment. Th experimental fact that the angle of maximum reflectance is greater than the angle of incidenc is explained by the theory. *Subject Headings:* **1. Spectral reflectivity 2. Albedo of snov 3. Goniophotometers.**—*Author's abstract.*

4.4–132 551.521.14:551.578.4

U. S. Corps of Engineers and U. S. Weather Bureau, **Trial estimates of net longwav radiation from snowpacks.** *U. S. Corps of Engineers and U. S. Weather Bureau, Cooperativ Snow Investigations, Research Note*, SPDGC 109-52, Feb. 28, **1952.** 13+p., figs., tables 19 refs. **DWB** A Gier-Dunkle radiometer was used for measurements of the effectiv long wave radiation at the Central Sierra Laboratory. The observed results are compare with values estimated by methods of BRUNT and ELSASSER. It is suggested that the mor simple method of BRUNT be used. *Subject Headings:* **1. Terrestrial radiation 2. Snow cove 3. Infrared radiation 4. Radiometers. I. Central Sierra Laboratory.**—*A.A.*

4.4–133 551.521.14:551.463:53

Vraskiĭ, S. B., **Opticheskie svoĭstva morskoĭ vody.** [Optical properties of sea water. *Priroda*, Moscow, 40(12):3–11, Dec. **1951.** 3 figs., eqs. **DWB**—A not very technical sum mary of available knowledge on the reflection of light from the surface of water, the quantitativ characteristics of the optical properties of water such as extinction, diffusion of light in water transparency of sea water and the color of the seas and of sea water. *Subject Headings* **1. Albedo of sea 2. Optical properties of sea water.**—*I.L.D.*

4.4–134 551.521.4

Martyn, D. F. (*Dartmouth College, Hanover, N. H.*), **The origin of the green line O[I in airglow.** *Journal of Geophysical Research*, 57(1):144–145, March **1952.** 5 refs. **MH-BH**— Green line of air glow is produced mainly in F2 region and is most intense near midnigh (earlier in summer and later in winter according to data obtained at Cactus Peak, Calif.) This seasonal variation is parallel to that of height of nighttime maximum electron density i F2 region in mid-latitudes. Mechanism of connection between two phenomena could b related to fact that nocturnal changes in height of F2 region are equal to change of 2/1 i pressure and collisional de-excitation is proportional to air density or to pressure. Thi interpretation demands that electrically charged particles participate at least catalytically *Subject Headings:* **1. Light of the night sky 2. F2 layer 3. Cactus Peak, Calif.**—*M.R.*

4.4–135 551.521.4:551.510.41

Roach, Franklin E. and Pettit, Helen B. (*U. S. Navy, Pasadena, Cal.*), **The annua variation of sodium D in the nightglow.** *Annales d'Astrophysique*, 14(4):392–398, 1951 5 figs., 3 tables, 8 refs. **DWB**—Photoelectric observations are recorded. A maximum in tensity in the winter and a minimum in the summer is observed. A seasonal movement of a excitation maximum is assumed. The diurnal variations are also examined. *Subject Headings* **1. Light of the night sky 2. Sodium spectra.**—*A.A.*

4.4–136 551.521.4

Roach, Franklin E. and Pettit, Helen B., **On the diurnal variation of [OI] 5577 in th nightglow.** *Journal of Geophysical Research*, 56(3):325–353, Sept. **1951.** 15 figs., 6 tables 29 refs. **MH-BH**—Observations made on 10 nights from 1949–1951 at Cactus Peak (Mojav Desert), Calif., at altitude of 5415 ft are described and summarized and equipment and record illustrated. A maximum of zenith intensity of 5577Å from O(I) is observed near midnight although time of maximum varies from season to season (from 11:30 P.M.–2:30 A.M., P.S.T.)

nd absolute value of maximum ranges from 2.5 to $4.5\times10^8$ quanta/cm² column/sec. Some-mes more than one maximum occurs on one night. Geographical patterns appear from a etailed study of all parts of the sky. These when plotted on a map of North America and the acific show a diurnal pattern which indicates that the phenomenon is caused by excitation t 250 km on the dark side of earth. Theories as to the mechanism are advanced. Winds, otation of earth and UV light (Maris and Hulburt theory) are among those advanced. *Sub-ct Headings:* **1. Light of the night sky 2. Spectral line 5577Å 3. Cactus Peak, Calif.**—*M.R.*

4.4–137 551.521.4

Roach, Franklin E. and Pettit, Helen B., **Excitation patterns in the nightglow.** *Société Royale des Sciences de Liège, Mémoires*, 12(1/2):13–42, **1952.** 19 figs., 2 tables, 17 refs. Ab-tracted from reprint. **DWB**—Systematic photometric observation of nightglow made in the Mojave Desert, Calif., from 1948 to 1951 is reported. Methods of differentiating between errestrial and extra-terrestrial contributors to the light of the night sky are discussed and the se of filters for the same purpose described. Data on three atomic radiations are presented nd their diurnal and seasonal variation, height of emission and movement of excitation atterns analyzed. *Subject Headings:* **1. Light of the night sky 2. Atomic radiation 3. Ra-iation filters 4. Mojave Desert, Calif.**—*G.T.*

4.4–138 551.521.61:551.571

Kondrat'ev, K. IA., **O kharakteristikakh pogloshcheniia dlinnovolnovoĭ radiatsii v tmosfere.** [On the characteristics of absorption of long wave radiation in the atmosphere.] *USSR. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Informatsionnyĭ Sbornik*, 1:75–2, **1951.** 2 figs., 6 refs., 5 eqs. **DLC**—The laws of absorption of long wave radiation by ater vapor are established. The possibility of application of two forms of absorption func-ions is discussed: $A(m)=\sum_{(i)} a_i\sqrt{m}$ (the so called square root law) and $A(m)=1-\sum_{(i)} C_i e^{-\alpha_i m}$ exponential function); $m$—optical mass, $a_i$, $C_i$—coefficients, $\alpha$—absorption coefficient. From he calculations the author draws the conclusion that the critics of the application of the xponential function of absorption are wrong. The law of square root which is largely used n American literature does not result in any progress. The rational use of the exponential law ppears to be more comprehensive. *Subject Headings:* **1. Infrared radiation 2. Absorption y water vapor.**—*N.T.Z.*

4.4–139 551.521.61:535.8

Plyler, Earle K. and Ball, Joseph J. (*Natl. Bureau of Standards, Wash., D. C.*), **Filters or the infrared region.** *Optical Society of America, Journal*, 42(4):266–268, April **1952.** figs. **DWB**—The infrared transmittance of deposited films of tellurium, bismuth, antimony, nd magnesium oxide has been measured. These filters are opaque in the visible region and ave short wavelength cutoffs varying from 1 to 3 microns. Reflection filters have also een made, for the region from 10$\mu$ to 40$\mu$, by roughening the surface of a mirror with emery owder. These filters are used in removing stray radiation from the KBr and KRS-5 regions f the spectrum. *Subject Headings:* **1. Infrared filters 2. Infrared spectroscopy.**—*Authors' bstract.*

4.4–140 551.521.9:551.586

Bortels, H., **Mikrobiologischer Beitrag zum Kausalproblem der Meteoro-Biologie.** Microbiological contribution to the causation problem of meteorobiology.] *Annalen der Meteorologie, Medizin-meteorologische Hefte*, No. 7:24–35, **1952.** 16 figs., 15 refs. **DWB**—Describes laboratory experiments on effect of alternation of depressions and anticyclones on ctivity of microorganisms. Little difference was found between those in the open and in ealed containers. Author attributes effect to unidentified soft "T-radiation" preceding epressions (Tief) and harder "H-radiation" preceding Highs. Effects confirmed by relation f precipitation of calcium phosphate to direction of sun or moon and effect of a metal shield. *ubject Headings:* **1. Radiation effects 2. Bioclimatic research.**—*C.E.P.B.*

4.4–141 551.521.9:536.33:551.586:61

Buettner, Konrad J. K., **KKK robe, light skin help foil A-bomb heat.** *Science New Letter*, 60(15):231, Oct. 13, **1951.** photo. **DWB**—Brief report on experiments made b the author, a German scientist, doing research for the U. S. Air Force School of Aviation Medi cine in San Antonio, Texas. The experiments carried out on heat created with a sun reflecto are said to have shown that only 10% of the heat rays to which a person might be exposed b A-bomb are reflected by black skin and 40% by white skin. A hooded suit and aluminur foil have been suggested by the scientist as best available shield against intense heat. *Subjec Headings:* **1. Aviation medicine 2. Atomic radiation. I. U. S. Air Force School of Aviatio Medicine.**—*G.T.*

## AIR TEMPERATURE

*See also:* **Black storm, winter 1951, Donbas** (Gritsenko), **4.4–164; Climatic changes or cycles?** (Conrad), **4.4–238; Mt. McKinley weather experiences** (Washburn), **4.4–251; Temperature dominance over human life** (Mills), **4.4–252; Respiratory air temperature measurement** (Webb), **4.4–254**

4.4–142 551.524.

Ookochi, Y., **Sudden increase of night temperature at Miyake Island.** *Journal of Me teorological Research*, Tokyo, 4(4):157–161, July **1952.** table, 8 figs. In Japanese, Englis summary p. (12). **MH-BH**—Temperature variations at Miyake Island are characterize by slow decrease and sudden increase when wind direction changes from south to north. Thi phenomenon is caused by dissolution of the inversion layer near the ground. Such dissolutio is due to the passage of a weak front accompanied by other phenomena. Frequently at suc times there is a small pressure gradient. *Subject Headings:* **1. Temperature variation 2. Miyake Island, Japan.**—*From author's abstract.*

4.4–143 551.524.31:551.555.

Bleibaum, Irma, **Abendliche und nächtliche Temperaturanstiege im Thüringer Wal und in der Rhön.** [Evening and night temperature rises in the Thuringian Forest and th Rhön.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:110–113, 1952 2 figs., 5 refs. **DWB**—A rise of temperature and fall of relative humidity frequently observe at night (about 3–4 h.) is illustrated. It is attributed to an "air avalanche" from the free ai on days with labile stratification. *Subject Headings:* **1. Diurnal temperature variation 2. Free föhn 3. Thuringia, Germany 4. Rhön, Germany.**—*C.E.P.B.*

4.4–144 551.524.31:551.543.

Dué Rojo, Antonio, **La oscilación termica en Granada.** [Thermal oscillation in Granada. *Urania*, Barcelona, 36(228):206–215, Oct.–Dec. **1951.** 2 tables, 8 figs., refs. **DWB**—Con trolled autographic records of temperature for 48 years at Cartuja, height 775 m, surrounde by mountains, are examined statistically for each month (daily range, deciles, quartiles standard and mean derivation, etc.) and results shown graphically. Diurnal and monthl oscillations of pressure, and numbers of clear, cloudy and overcast days, are also examine and some relations shown as climagrams. *Subject Headings:* **1. Diurnal temperature variation 2. Pressure variations 3. Climagrams 4. Cartuja, Spain.**—*C.E.P.B.*

4.4–145 551.524.32:523.7

Voigts, Henrich, **Gang der Jahresmitteltemperatur im Sonnenfleckenzyklus. II. Mit teilung.** [Annual mean temperature variation during the sunspot cycle.] *Zeitschrift fü Meteorologie*, 6(6):174–181, June **1952.** 6 figs., 6 tables, 6 refs. **MH-BH**—In this continuatio of a previous study (*see item* 2.10–102, Oct. 1951, *MAB*) on the relationship between th variations of mean annual temperature and sunspot cycles the author studies this relationshi over the entire world. Statistical data over the period 1871–1890 show a parallel relationshi between sunspot and solar flare cycle. Data on the annual variations of mean annual tem perature and atmospheric pressure during the sunspot cycle for the entire world are presente in tables and graphs and the relationship of temperature minima and maxima to the sunspo cycle is described. A double oscillation of the temperature minima is found in Europe an

frica; it is not so marked elsewhere. *Subject Headings:* **1. Annual temperature variations . Sunspot cycles.**—*I.L.D.*

4.4–146 551.524.34(52)

Takahashi, S., **The generalization of Umeda's method concerning to secular change of ummer temperature in Tohoku and Hokkaido districts.** *Journal of Meteorological Research*, (9):305–308, July **1951.** fig., tables, refs. In Japanese. **DWB**—Based on classification f circulation types in various years from data for Dutch Harbor—Japan, and extreme monthly ean temperatures at Hakodatu and Miyako (1869–1952), lunar cycles, etc. *Subject Headings:* **. Temperature trends 2. Summer temperatures 3. Japan.**—*M.R.*

4.4–147 551.524.35:581.056(798)

*Oswalt, Wendell (*Univ. of Alaska, College*), **Spruce samples from the Copper River drain-ge, Alaska.** *Tree-ring Bulletin*, Tucson, Arizona, 19(1):5–10, July, **1952.** 3 figs., table, 1 refs. **DWB**—Annual mean tree-ring widths for five regional groups of spruce in the Copper River drainage are tabulated for periods ranging over 71 to 128 years ending 1950. Yearly variations of tree-ring width of Copper River groups are compared with other series sampled n Alaska and with annual mean June–July temperature in the Copper River basin. Sampling nethods and results are briefly discussed. Location of sampling sites is shown on a map. *ubject Headings:* **1. Tree ring growth 2. Temperature variations 3. Copper River, Alaska.**— *.T.*

4.4–148 551.524.36(41/2)

Anderson, G. P. and Eatwell, H. J., **A survey of ambient temperatures at selected me-eorological stations in the United Kingdom.** *Anglo-Iranian Oil Co. Ltd., Research Station, unbury-on-Thames, Report* No. 4612, **1952.** 23 p. 6 plates, 19 tables. Mimeographed. **GB-MO**—To facilitate decisions regarding fuel and lubricating oil quality, tables of extreme emperatures at places in Britain 1940–50 and 1874–83, and average duration in hours and requency of temperatures exceeding and falling below various limits in 1874–83 are given for Kew, Glasgow and Falmouth. The results are shown in smoothed curves. *Subject Headings:* **. Temperature frequencies 2. British Isles.**—*C.E.P.B.*

4.4–149 551.524.36:519.241

Anderson, R. and McClellan, D. E. (*Central Analysis Office, Met. Div.*), **Temperature requencies.** *Canada. Meteorological Division, Circular* 2073, TEC-109, March 6, **1952.** 2 p. ref., appends. **DWB**—It is pointed out that before an extended forecast program can e initiated in Canada, it is necessary to establish standard temperature ranges for a number f stations, similar to the temperature limits determined by U. S. Weather Bureau for about 50 stations in the U. S. Temperature normals, and 5 categories of departure from normal are letermined for Ottawa. Records used and methods of analysis are discussed. Values of emperature ranges and frequencies computed from data obtained over the period 1890–1950 re presented. *Subject Headings:* **1. Temperature frequencies 2. Statistical analysis . Canada.**—*G.T.*

## SOIL TEMPERATURE

4.4–150 551.525.4

†*Chudnovskiĭ, A. F., **Fizika teploobmena v pochve.** [Physics of heat exchange in the oil.] Leningrad, OGIZ, **1948.** 220 p. 44 figs., 13 tables, 179 refs., 188 eqs. **DLC**—The uthor presents the theoretical basis and experimental procedures for studying heat exchange n the soil. He sets up a physico-mathematical model with heat balance equations for de-cribing the heat exchange within the soil and analyzes mathematically the role of the heat xchange of the soil in the general heat balance and its significance in microclimatology and n the cooling of the upper soil layer. Various procedures for determining the heat conductivity f soil, heat capacity of soil, etc. are presented. The dependence of thermal properties upon hemical and mineral characteristics of the soil, the effect of soil temperature upon its thermal roperties, the dependence of thermal properties upon soil moisture and the daily heat regime t various depths are considered. A theory for the diffusion of heat in the upper layers of

the soil is presented and its application in determining soil moisture by means of therma properties of the soil and for calculating radiational cooling by means of heat balance is illus trated. (*Same item as* 2C–189, March 1951, *MAB.*) *Subject Headings:* **1. Soil temperature 2. Thermal gradient.**—*I.L.D.*

4.4–151 551.525.4:63(68

*de Villiers, G. D. B. (*Stellenbosch Fruit Res. Station*), **Soil temperature data for Stellen bosch and Groot Drakenstein.** *South Africa. Dept. of Agriculture, Science Bulletin*, No. 309 *Fruit Research, Technical Series*, No. 27 [1951–52]. 87 p. tables, figs., refs. Price: 1s **DWB**—An intensive climatic study was carried out by the College of Agriculture of the Uni versity at Stellenbosch (18°51′S; 33°56′E and about 390 ft above sea-level) from 1936 to 193 for the purpose of investigating certain aspects of the problem of delayed foliation of deciduou fruit trees. The standard maximum and minimum thermometers in the Stevenson screen, black bulb solar radiation maximum thermometer, a Casella siphon rainfall recorder, Campbell-Stokes sunshine recorder, a Robinson four-cup anemometer and Pickering's standar evaporimeter were used for observations at hourly intervals. The soil temperature was meas ured at depths of 2, 12, 24 and 48 in. by means of thermocouples in soil which was regularly weeded but left uncultivated. Since 1941 the study has been continued at Groot Drakenstei (Agro-meteorological observatory—18°59′S; 33°50′E and 453 ft above sea-level), where detailed observations of all climatic elements were made. The soil temperature was observed at depth of 6, 12 and 24 in. The analysis of observations and numerous tables give extensive data o soil temperature and other climatic factors. Soil temperature data for Groot Drakenstei are given for period of 1941–1946. *Subject Headings:* **1. Soil temperature data 2. Temperature data 3. Agricultural climatology 4. Stellenbosch, South Africa 5. Groot Drakenstein South Africa.**—*N.T.Z.*

4.4–152 551.525.4:550.3

Liubimova, E. A., **Vliianie radioaktivnogo raspada na teplovoĭ rezhim zemli.** [Effects o radioactive decay upon the heat regime of the earth.] *Akademiia Nauk, SSSR Izvestiia, Ser Geofiz.*, 2:3–14, **1952.** 4 figs., 19 refs., 18 eqs. **DLC**—The author presents a solution of th equation of heat conduction for the earth heated by radioactive heat sources which gradually decline with time. The equation is solved by the method of reflection, represented as a rapidly converging infinite series, which facilitates the calculation of temperature change a any depth in the earth. Results of calculations of the internal temperatures and the geo thermal gradient at the surface are presented for a homogeneous earth. *Subject Headings* **1. Earth temperature profile 2. Heat conductivity of soil 3. Radioactivity of soil.**—*I.L.D.*

4.4–153 551.525.5

Hale, Charles E., **Further observations on soil freezing in the Pacific Northwest.** *U. S Forest Service. Pacific Northwest Forest and Range Experiment Station, Research Notes*, No 74, Oct. **1951.** 8 p. tables, refs. **DWB**—Describes extent and kind of soil freezing in north slope lodgepole pine stands on deep pumice soils, in southeast slope grass cover on poorly drained shallow clay loam soils, and in southwest slope ponderosa pine stands on deep loam soils in the Blue Mountains of eastern Oregon during the winter 1950–1951. Includes graphs of trends of snow depth and soil frost depth through the season for each cover type. Im permeable frost was observed in all types; most often and of longest duration in the north slope pumice soils, least often on the south slopes. Snow depth, influenced by aspect and cover, was a more important factor than soil depth or drainage characteristics in determining frost occurrence. No extensive areas of impermeable frost were observed; and the effect upon snow melt runoff did not appear important hydrologically. *Subject Headings:* **1. Soil freezing 2. Snow cover 3. Pacific Northwest.**—*Author's abstract.*

## SEA TEMPERATURE

4.4–154 551.526.6:551.311.1:016(268)

†Canada. Dept. of Mines and Technical Surveys. Geographical Branch, **Canadian ice distribution survey; project presentation.** Ottawa, **1951.** 15 p. Also microfilm, No. 753 (1336 frames). **DWB**—Description of project and survey of previous work done along that

ne. It is proposed that accurate charts be prepared of limits of polar ice and icebergs from ata obtained by air, sea and ground surveys. Definitions are given for a few ice terms used y Canadian Navy. An Ice Information File containing over 2000 abstracts from 50 sources as been inaugurated. Material contained on 1336 cards is included in microfilm No. 753. *ubject Headings:* **1. Polar ice distribution 2. Ice surveys 3. Ice Information File (Canada) . Bibliographies 5. Canadian Arctic.**—*M.R.*

4.4–155 551.526.6

Eckel, O., **Über Mittel- und Extremtemperaturen des Lunzer Untersees.** [Mean and xtreme temperatures of the Lunz Untersee.] *Wetter und Leben, Sonderheft,* No. 1:20–25, *Aay* **1952.** figs., 3 tables, 6 refs. **MH-BH**—An analysis of the temperature soundings made veekly over a period of 50 years at various depths and at the surface near a point where the ake attains its greatest depth. Highest, lowest and average decadal temperatures for each neasured depth for every month and mean monthly surface temperatures are given in tables. The calculation of mean spatial temperatures and the determination of heat content at various epths is discussed and illustrated. The annual march of temperature at various depths is iscussed. *Subject Headings:* **1. Sea temperatures 2. Lunz Untersee, Austria.**—*I.L.D.*

4.4–156 551.526.6(261.2)

*Goedecke, Erich, **Über neue Reihen langjähriger Monats- und Jahresmittel der Wasser-emperatur sowie ihrer Extreme in der Deutschen Bucht.** [On new long-period monthly and nnual means of the water temperature and their extremes in the Heligoland Bight.] *Annalen er Meteorologie,* 5(1/2):1–14, **1952.** 11 tables, 26 refs. German and English summaries . 1. **DWB**—Temperatures of surface and bottom waters are given for 15 lightships anchored n depths of 13–35 m, and at Heligoland. For each month and for the year are given means nd mean and extreme maxima and minima, periods mostly about 1920–39. Recent values re compared with means for earlier periods back to 1873. Means show a slight fall 1873/93 o 1893/1907, but a steady rise during present century. In west of southern North Sea the se is mainly in winter, in the east in summer. *Subject Headings:* **1. Sea temperatures . Long period records 3. North Sea.**—*C.E.P.B.*

## ATMOSPHERIC PRESSURE AND WIND

### PRESSURE

*See also:* **Determining geostrophic wind spacing of contours** (Wasko), 4.4–33; **Relationship between fields of atmos. pressure, upper level temp. and behavior of surface pressure systems** (George, Roche, etc.), 4.4–68; **Thermal oscillations, Granada** (Due Rojo), 4.4–144; **Semidiurnal atmos. vapor pressure wave** (Neumann), 4.4–180; **Body temp. oscillations and their relation to föhn-like conditions** (Wagner), 4.4–259

4.4–157 551.543:551.509.39

Schmauss, August, **Das Barogramm als Wetterberater.** [The barogram as weather orecaster.] *Germany. Deutscher Wetterdienst in der U. S. Zone, Berichte,* No. 38:77–78, **952. DWB**—Note on value of barograph in local forecasting, especially comparison at two ifferent levels and use in finding symmetry points. *Subject Headings:* **1. Local forecasting . Barographs.**—*C.E.P.B.*

4.4–158 551.543

Spar, Jerome, **The annual meridional tide in the atmosphere.** New York University. College of Engineering. Research Division, Contract AF19(122)-40, Project 122, Scientific eport No. 1 [**1952**]. 9 p. 2 tables, ref., eqs. **DWB**—The annual oscillation of the surface ressure in a zonally symmetrical atmosphere is calculated for the case of a simple annual emperature wave in one hemisphere. The linearized equations of motion and continuity are ntegrated with respect to height. The annual temperature wave is postulated as a function f height, time and latitude. The surface pressure oscillation is then found, by the method of ontinued fractions, as a function of latitude and time. According to the theory the surface ressure reaches a maximum value in winter near latitude 40 degrees. There is no pressure

variation at the equator. A secondary minimum occurs at the pole in spite of the fact tha the temperature variation is assumed to be a maximum at the pole. *Subject Heading* **1. Pressure oscillation measurement 2. Meridional tides. I. New York University. Colleg of Engineering. Research Division II. Contract AF 19(122)-49, Project 122.**—*Author' abstract.*

4.4–159 551.543.1:551.558.2

Georgii, Walter, **Wettersteuerung durch die tägliche Doppelwelle des Luftdruckes i Mendoza/Argentinien.** [Weather steering by the semidiurnal pressure wave at Mendoz (Argentina).] *Meteorologische Rundschau*, 5(5/6):97–99, May/June, **1952.** 5 figs. **MH-BH**—At Mendoza the semidiurnal pressure wave brings a rise of temperature at 4–6 h, frequenc of Zonda (föhn) and thunder with hail, associated with the stationary wave over the mountain A schematic diagram shows a peculiar system of three rotors in lee of mountains. *Subje Headings:* **1. Lee waves 2. Diurnal pressure variations 3. Zonda 4. Mendoza, Argentina.**— *C.E.P.B.*

4.4–160 551.543.

†Aniol, Rudolf, **Wellenuntersuchungen in der Leipziger Schule.** [Wave investigatio in the Leipzig School.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, N 38:78–80, **1952.** 38 refs. **DWB**—Summary of work on pressure waves initiated by WEICH MANN in 1924. *Subject Heading:* **1. Pressure waves.**—*C.E.P.B.*

4.4–161 551.543.3(51

Nagao, T., **20-day period of air pressure near Shanghai.** *Journal of Meteorologic Research*, Tokyo, 3(14/15):474–479, Dec. **1951.** 5 figs., 2 tables. In Japanese, Englis summary p. (31). **MH-BH**—In this paper the author analyzed the 20-day period of a pressure often found at Shanghai and its neighbourhood from Feb. to May, and the resul obtained are as follows: 1. Periodic change mostly develops from Feb. to March. 2. Spati distribution of periodic change is given (fig. 2). 3. Statistically, the center of periodic chan is at Shanghai and its neighbourhood. 4. The above change is considered to be stationa oscillation and to accompany the temperature change as shown in Fig. 5. *Subject Heading* **1. Pressure variations 2. Periodicities 3. Pressure distribution 4. Shanghai, China.**— *Author's abstract.*

## WINDS

*See also:* **Inhibition of convection by magnetic field** (Chandrasekhar), 4.4–2; **Zonal wind profile between pole and equator** (Arakawa), 4.4–108; **Evening and night temp. rises, Thuringia, Rhön** (Bleibaum), 4.4–143; **Unusual visibility in spite of dust fall, Mediterranean** (Rodewald), 4.4–265

4.4–162 551.555

Blanco, M., Alfonso, **Las tolvaneras o tormentas de polvo en el Valle de México, s causas y sus remedios.** [Dust storms in the Valley of Mexico, their causes and prevention *Sociedad Mexicana de Geografía y Estadística, Boletín*, 70(1/3):111–128, July/Dec. 195 **DWB**—A most important ecological factor responsible for the frequent dust storms in t Valley of Mexico is the desiccation of Lake Texococo, and of other lakes. The decline atmospheric humidity combined with the high altitude of the central Plateau intensify no turnal cooling and diurnal heating thus intensifying evaporation from soil and plants a exciting a distinctive action on the former. The proposed remedies include restoration the lake of Texococo, of other lakes, the program of reforestation, and the melting of the sno on the volcanoes of Iztaccihuatl and Popocatepetl. *Subject Headings:* **1. Dust storm 2. Desiccation 3. Valley of Mexico.**—*I.L.D.*

4.4–163 551.555

**Dust storm near Mafraq.** *Meteorological Magazine*, London, 81(962):248–249, Au **1952.** 2 photos. **MH-BH**—Photographs from 10,000 ft of duststorm 11,000 ft high 32°24′N, 36°49′E, probably in a front. *Subject Headings:* **1. Dust storms 2. Mafrak, Jorda** —*C.E.P.B.*

4.4–164 551.555.8:551.524.36(4)

Gritsenko, I. F., **Chernaiia buria zimoĭ 1951 g. v Donbasse.** [Black storm of the winter of 1951 in the Donbas.] *Priroda*, Moscow, 40(12):43, Dec. **1951. DWB**—During winter of 1950–51 the snowfall was abnormally low and at the end of Feb. the ground was almost completely free of snow. At that time strong easterly winds with low relative humidity began to blow; and the air temperature fell to −16.5°C. By Feb. 28 the wind velocity reached 20 m/sec. A dust fog was present until March 2. The destructive effect of the black storm upon plants is discussed. *Subject Headings:* **1. Dust storms 2. Extreme temperatures 3. Dust haze 4. Donbas, U.S.S.R.**—*I.L.D.*

4.4–165 551.555.8:551.311.3

Johnson, George D., **Wind erosion.** *Successful Farming*, Des Moines, 50(4):56–57, 202, 204–205, April **1952.** photos. **DWB**—Studies in wind erosion made in a specially constructed wind tunnel at Kansas State College (by A. W. Zingg and W. S. Chepil) show that particles of <1/2 mm diameter with winds >12 mph at one foot above ground are responsible for damage and even dust storms. Particles move in 3 ways: 1) rolling, 2) bumping and 3) completely air-borne, depending on size and wind speed. It was found that 9 ft of top soil have been lost in 20 years. Recently tilled soil is the most erodible. April is worst month for dust storms in the Great Plains. Gustiness is more decisive than average wind speed. Measures for prevention of wind erosion are suggested. *Subject Headings:* **1. Wind erosion 2. Dust storms 3. Wind tunnels 4. Kansas. I. Zingg, A. W. II. Chepil, W. S.**—*M.R.*

4.4–166 551.555.8

§Rodewald, Martin, **Staubsturm im Suez-Kanal. (Mai 21, 1952.)** [Dust storm in the Suez Canal.] *Wetterlotse*, 43:156–160, Sept. **1952.** 3 figs. **DWB**—At 15 h "Olympic flame" reported dust storm with sudden rise of air temperature from 26–36°C and wind shift of nearly 180°. Due to an upper cold front of a depression over desert, which was converted by hot ground into a warm front at the surface, causing turbulent vertical exchange. *Subject Headings:* **1. Dust storms 2. Suez Canal.**—*C.E.P.B.*

4.4–167 551.555.9:551.556(55)

Stratil-Sauer, G., **Die Sommerstürme Südost-Irans.** [The summer storms of S.E. Iran.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):133–153, **1952.** fig., 50 refs. German, English and French summaries p. 133–134. **DWB**—Stormy NE–NW winds similar to the "wind of 120 days" but less developed are found in all the plateaus and basins of S.E. Iran. Geographical distribution is summarized and traced with decreasing intensity S.E. into Baluchistan, partly by evidence of dunes. In the desert of Lut S winds are also frequent in summer, and the E. Persian dunes are attributed to local whirls over the hot basins, accumulating where the air currents rise vertically, and at obstacles. There are no continuous air streams. *Subject Headings:* **1. Wind of 120 days 2. Iran.**—*C.E.P.B.*

## WIND EFFECTS

*See also:* **Hennepin County tornado, July 20, 1951** (Hovde), 4.4–112; **Summer storms, S.E. Iran** (Stratil-Sauer), 4.4–167; **Hydrodynamic theory of wind desiccation** (Slezkin), 4.4–183

4.4–168 551.556:629.12:551.509.52

Allen, Louis Pinckney, Jr. (*U. S. Off. Naval Res., Wash. D. C.*), **Navigating the weather.** *American Meteorological Society, Bulletin*, 32(7):245–250, Sept. **1951.** 5 figs. Same article condensed, with title "Engineering the weather for better navigation," in *U. S. Office of Naval Research, Research Reviews*, Sept. 1951:16–24. **DWB**—Despite the improvement in navigation with the replacement of sailing vessels by steamships, winds still affect ship operation in addition to disturbing the sea. The author summarizes studies of the Deutsche Seewarte and studies on U. S. Naval transports with reference to the effect of wind upon moving ships. The possible role of meteorology in forecasting wind conditions and their effect upon the sea,

the wind frequencies along ship routes and upon the ship directly is indicated. *Subject Headings:* **1. Wind effects 2. Marine navigation 3. Wind forecasting.**—*I.L.D.*

4.4–169 551.556:624:533.6

Fraser, R. A. and Scruton, C., **A summarized account of the Severn bridge aerodynamic investigation.** *Great Britain. Scientific and Industrial Research. National Physical Laboratory, Teddington, Report*, No. N.P.L./AERO/222:58, **1952.** 35 plates, 20 tables, refs. Appendix; **A discrete theory of the natural oscillations of a three-span suspension bridge.** [34 p.] 4 figs., tables, eqs. Mimeographed. **GB-MO**—This report is mainly concerned with experiments on a model of the proposed bridge. They included the effect of winds, including inclined and gusty winds, critical wind speeds in relation to harmonic oscillations, etc. *Subject Headings:* **1. Wind pressure 2. Aerodynamics.**—*C.E.P.B.*

4.4–170 551.556:69

Howe, J. W. (*State Univ. Iowa*), **Wind pressure on elementary building forms evaluated by model tests.** *Civil Engineering*, New York, 22(5):42–46, May **1952.** 10 figs. **DLC**—Wind pressure measurements made in a low-velocity wind tunnel by using models of various buildings in different positions, are reported. Results of the experiment are presented in formulas, curves and diagrams, giving wind load on each part of the buildings. An example illustrating the application of these results in practical computation of wind load is offered. The experiment was conducted at the Iowa Institute of Hydraulic Research. Copies of a complete report by CHIEN, FENG, WAND and SIAO under the title "Wind-tunnel studies of pressure distribution on elementary building forms" can be obtained from the Institute at the price of $1.75 each. *Subject Headings:* **1. Wind load on structures 2. Wind tunnel experiments.**—*G.T.*

4.4–171 551.556:551.465

Neumann, Gerhard, **The generation of water waves by wind.** *U. S. Beach Erosion Board, Bulletin*, 6(1):26–29, Jan. 1, **1952.** tables, graph. Abstract of English translation of original in German from *Deutsche Hydrographische Zeitschrift*, 2(5), **1949. DWB**—"Theory presented for computing length and amplitude of initial waves generated by incident winds of different velocities, which is valid until the initial waves attain a steepness where they are no longer stable and turbulence occurs. . . ." Any wind with velocity > 69.5 cm/sec is capable of generating waves, and combined effect of capillarity and gravity produces two separate wave trains. Computation made for various wind speeds and for shallow water layers or where wave length is > water depth. *Subject Headings:* **1. Wind waves 2. Shallow water waves 3. Oceanography 4. Wind-wave relationships.**—*M.R.*

4.4–172 551.556:551.46

Neumann, Gerhard, **Über die komplexe Natur des Seeganges. 1. Teil. Neue Seegangsbeobachtungen im Nordatlantischen Ozean, in der Karibischen See und im Golf von Mexico (M.S. "Heidelberg," Oktober 1950–Februar 1951).** [On the complexity of the state of the sea. Pt. 1. New observations of the state of the sea in the North Atlantic, Caribbean Sea and Gulf of Mexico).] *Deutsche Hydrographische Zeitschrift*, 5(2–3):95–110, **1952.** 8 figs., 2 tables, 9 refs., 6 eqs. German, English and French summaries p. 95. **DWB**—A series of waves passing a given point is made up of a complex of independent periods, forming a band dependent on the wind force. There are generally 3 major wave groups, the interference of which causes the observed variations of wave length and height. Detailed observations are shown in a folding table. *Subject Headings:* **1. Wave heights 2. North Atlantic 3. Caribbean Sea 4. Gulf of Mexico.**—*C.E.P.B.*

4.4–173 551.556:551.515.8:551.46

Roll, Hans-Ulrich, **Über Grössenunterschiede der Meereswellen bei Warm- und Kaltluft.** [On the size-difference of sea waves in warm and cold air.] *Deutsche Hydrographische Zeitschrift*, 5(2–3):111–114, **1952.** 2 figs., 5 refs. German, English and French summaries p. 111. **DWB**—Observations on N. Atlantic weather ships show that with winds of equal force waves are higher and steeper in cold than in warm air. *Subject Headings:* **1. Wave heights 2. Wind effects 3. Air masses.**—*C.E.P.B.*

## WIND AND VERTICAL MOTION

*See also:* **Accuracy of 100 mb winds** (Johnson), 4.4–31; **Determining geostrophic wind spacing of contours** (Wasko), 4.4–33; **Configuration of mean field of atmos. motion, its origin** (Wippermann), 4.4–106; **Example of flight through thunderstorm updraft** (Byers), 4.4–123; **Weather steering by semidiurnal pressure wave, Mendoza** (Georgii), 4.4–159

4.4–174 551.557:551.510.52/3

Austin, E. E. and Bannon, John Kerman, **Relation of the height of the maximum wind to the level of the tropopause on occasions of strong wind.** *Meteorological Magazine*, London, 81(965):321–325, Nov. 1952. 2 figs., table, 3 refs. **MH-BH**—For Larkhill and Lerwick 1948–50 frequencies are given of pressure at (a) level of maximum wind $\geq 70$ kt; (b) at tropopause; (c) a-b. Means of (a) and (b) and correlation $r$ between them are: Larkhill 268, 226 mb, $r$ 0.43; Lerwick 278, 244 mb, $r$ 0.18. Results are discussed in relation to structure of jet stream. At Lerwick maximum wind often occurs well above tropopause. *Subject Headings:* **1. Upper air winds 2. Jet stream.**—*C.E.P.B.*

4.4–175 551.557:551.513:629.13

Blair, Charles F., Jr., **Flying the jet stream.** *Skyways*, New York, 10(9):12–13, 46–47, Sept. 1951. 4 photos. **DWB, DLC**—Experiences of the author in a flight from New York to London on Jan. 31, 1951 with special pains being taken to follow the jet stream. Tail winds as high as 230 m.p.h. were found at 35,000 ft in the vicinity of weather ship "Charlie," giving the pilot a ground speed of 600 m.p.h. At high altitudes the jet stream may be avoided by flying the northern route (via Iceland) on the return trip from England. *Subject Headings:* **1. Aeronautical meteorology 2. Jet stream 3. High altitude flying.**—*M.R.*

4.4–176 551.557.36

Davies, D. A. and Sansom, H. W., **Easterly jets over east Africa.** *Weather*, 7(11):343–344, Nov., 1952. 2 tables, 2 refs. **MH-BH**—Daily radar wind measurements at Nairobi Jan. 1948 through Nov. 1951 showed 6 spells of easterly winds exceeding 45 knots around 150 mb, maximum 77 knots. Peculiarities are summarized. *Subject Headings:* **1. Easterly jet stream 2. East Africa.**—*C.E.P.B.*

4.4–177 551.558.21:797.5

Lee, G. H. and Neumark, O. W., **A standing wave at Dunstable.** *Meteorological Magazine*, London, 81(964):307–310, Oct. 1952. fig., 2 tables. **DWB**—On Sept. 22, 1951, with SE winds, lift of 4–5 ft/sec was found NW of Dunstable Downs, Bedfordshire. Area of lift mapped and conditions discussed. *Subject Headings:* **1. Lee eddies 2. Standing waves 3. Gliding.**—*C.E.P.B.*

4.4–178 551.558

Painter, H. E., **Vertical currents observed at Habbaniya, May 6, 1952.** *Meteorologica Magazine*, London, 81(965):339–340, Nov. 1952. 2 figs., ref. **MH-BH**—Rawin ascent in very unstable air showed downward velocities up to 2100 ft/min near a low pressure center. *Subject Headings:* **1. Vertical velocities 2. Habbaniya, Iraq.**—*C.E.P.B.*

4.4–179 551.558.21

Laird, A. R., **Standing wave at Aberporth.** *Meteorological Magazine*, London, 81(965):337–339, Nov. 1952. 2 figs., 2 refs. **MH-BH**—Plots of rate of ascent of pilot balloons (double theodolite) passing over a 400 ft drop show descent (up to 650 ft/min) at cliff edge, ascent (350 ft/min) 15,000 ft downwind, and further descent about 27,000 ft downwind. *Subject Headings:* **1. Lee waves 2. Aberporth, Wales.**—*C.E.P.B.*

# AQUEOUS VAPOR AND HYDROMETEORS

## HUMIDITY

*See also:* **Water vapor in upper air** (Dobson and Brewer), 4.4–5; **Long wave absorption in atmos.** (Kondrat'ev), 4.4–138; **Internal moisture cycle** (KHromov), 4.4–200

4.4–180 551.571.31:551.543.1

Neumann, J., **On the semi-diurnal wave of atmospheric vapour pressure.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B,* 4(2):122–132, **1952.** 2 figs., 4 tables, 16 refs., 15 eqs. English, German and French summaries, p. 122–123. **DWB**—Assuming that semidiurnal waves of pressure $A_2$ and temperature $C_2$ are opposite in phase, density wave $B_2$ can be calculated. Density of moist air is sum of densities of dry air and water vapor. Then phase $E_2$ of semidiurnal vapor pressure wave lies between 180° and 270°-$A_2$ (approx 120°). These theoretical relations are examined for various stations in Jan. and July, including oceans and height effect. Near equator $E_2$ is controlled by $A_2$, in high latitudes by $C_2$, in mid latitudes by $A_2$ in winter and $C_2$ in summer. *Subject Headings:* **1. Diurnal humidity variations 2. Semi-diurnal pressure waves**—*C.E.P.B.*

4.4–181 551.571.36(793)

Harrison, Louis P., **Low humidity in the southwest.** *Weatherwise,* 5(2):31, April **1952. MH-BH**—Relative humidities recorded at Las Vegas, Nevada, during June 1951 were unusually low. On 6 days the relative humidity was less than 3% with a total of 31 hourly observations within this range. The frequencies of relative humidities during this month are given. The author believes that FERREL's psychrometric equation, used for evaluating the dewpoint temperature and relative humidities, is unreliable for very low relative humidities. *Subject Headings:* **1. Humidity extremes 2. Low humidity frequencies 3. Las Vegas, Nev.**—*I.L.D.*

## EVAPOTRANSPIRATION

*See also:* **Internal moisture cycle** (KHromov), 4.4–200; **Ablation of snow deposits, Cumberland,** (Richardson), 4.4–215; **Plant and soil water relations on watershed,** 4.4–221

4.4–182 551.573

Rider, Norman E., **The evaporation from an oat field during the late spring and summer of 1951.** *Great Britain. Meteorological Research Committee, M.R.P.* 724, April 30, **1952.** 13 p. 7 figs., 2 tables, 20 refs., eqs. Mimeographed. **DWB**—The aerodynamic formula for evaporation from gradients of wind speed and specific humidity is extended to include zero displacement (height of effective surface above the ground, calculated from wind speeds at 3 heights) and Richardson number (for departure from adiabatic). The revised equation is applied to observations at various points in an oat field near Cambridge, England, recorded automatically at heights up to 160 cm depending on the crop height. The setup is fully described and illustrated, specimen records shown, and a number of values of daily water loss computed (ranging from 0.05 to 5.65 mm). Values are estimated as up to 15% too low. *Subject Headings:* **1. Evapotranspiration 2. Cambridge, England.**—*C.E.P.B.*

4.4–183 551.573:551.556:551.579.5

Slezkin, N. A., **Osnovy gidrodinamicheskoĭ teorii vyvetrivaniia vlagi.** [Foundations of the hydrodynamic theory of wind desiccation.] *Akademiia Nauk, SSSR, Doklady,* 83(1):67–70, **1952.** ref., 17 eqs. **DLC**—The hydrodynamic theory of wind desiccation of the upper soil surface is the theory of the relationship between air movement above the soil surface and flow of ground water below the surface. On the assumption that the air is incompressible and turbulent, that the surface is impermeable to air, that the water vapor entering the atmosphere does not influence air flow, and that the coefficients characterizing the porosity of the medium are constant, the author determines by means of the equation of Neumann and Dirichlet the effect of topography upon wind desiccation and the amount of desiccation per

surface area for given wind velocity. The general solution of the action of wind desiccation on the presence of a simple dense hedge, and for wind desiccation from a cylinder are presented. *Subject Headings:* **1. Wind desiccation 2. Soil moisture 3. Topographic effects.**—*I.L.D.*

## CONDENSATION

*See also:* **Ice crystals formation** (Nakaya), 4.4–12

4.4–184 551.574.1:551.576.11

Ehrenberg, Wolfgang W., **Beitrag zum Problem der Eisbildung in Wasserwolken.** [Contribution to the problem of ice formation in water clouds.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):158–165, **1952.** 3 figs., 4 refs., 4 eqs. German, English and French summaries p. 158. **DWB**—By spraying glass of container with paraffin or smearing with vaseline, distilled water drops could be supercooled to −10°C. A method of finding total surface of fine particles is described. Supercooling at formation of ice nuclei increased with log (total surface); quartz, pampas dust, cellulose, volcanic ash, charcoal and AgI prepared by various methods gave rather similar results, so that chemical composition is less important than surface area. An effective area is 1/20 $cm^2$ per $cm^3$ water. The energy of agitation determines the probability of formation of ice nuclei. Theoretical implications are discussed. *Subject Headings:* **1. Condensation nuclei 2. Artificial condensation.**—*C.E.P.B.*

4.4–185 551.574.1:551.508.91

Jacobi, W., Junge, Chr. and Lippert, W., **Reihenuntersuchungen des natürlichen Aerosols mittels Elektronenmikroskops.** [Serial investigations of natural aerosols by the electron microscope.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A*, 5(2):166–178, **1952.** 6 figs., 4 refs. German, English and French summaries p. 166. **DWB**—Konimeter preparations of particles $5\times10^{-6}$ to $10^{-3}$ cm radius at Taunus Observatory, Nov. 16–Dec. 7, 1951, in lively W circulation were examined by electron microscope (×4500); photographs shown, apparatus and technique described. Daily plot given of weather and numbers of particles: 1) pale translucent often without solid nucleus (possibly Ammonium sulfate), 2) sharp edged spheres (industrial), 3) irregular flocculent aggregates (industrial) and 4) occasional fine chains (of nearby origin). Curves of frequency are shown in relation to humidity and origin discussed. *Subject Headings:* **1. Aerosol measurement 2. Aerosols.**—*C.E.P.B.*

4.4–186 551.574.1

Junge, Christian, **Das Grössenwachstum der Aitkenkerne.** [The growth-rate of Aitken nuclei.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:264–267, **1952.** 3 figs., 2 refs. **DWB**—Methods of measuring growth curves of nuclei of radius $10^{-6}$ to $10^{-5}$ cm are described. Growth only occurs with relative humidity >40%; that of larger nuclei increases rapidly above 90%. Radius at 95% is 1.03 to 1.41 times that at 40%. This confirms the view that continental nuclei are of mixed origin. *Subject Heading:* **1. Hygroscopic nuclei.**—*C.E.P.B.*

4.4—187 551.574.1:551.576.1

Ogiwara, Sekiji, **On the solid condensation nucleus which is not soluble in water. (Studies on the formation of cloud and rain III.)** *Tohoku University, Science Reports, 5th Ser., Geophysics*, 2(3):158–162, Dec. **1950.** 4 figs., 2 tables, 4 refs., 8 eqs. **DWB**—A thermodynamical investigation of the water film formed on a nonhygroscopic nucleus, along with a study of the role of solid nuclei in the condensation process. It is shown that a solid nucleus can also act as a condensation nucleus in the atmosphere. *Subject Headings:* **1. Condensation nuclei 2. Cloud physics 3. Nonhygroscopic nuclei.**—*W.N.*

4.4–188 551.574.1:551.576.11

Phillips, B. B. and Woessner, R. H. (*U. S. Weather Bur.*), **Continuous generation of a cloud for laboratory investigations.** *Journal of Meteorology*, 9(5):370–373, Oct. **1952.** fig., 3 refs., 2 eqs. **MH-BH**—An apparatus is shown by which laboratory clouds can be generated by mixing two masses of saturated air at different temperatures. Drop size can be regulated and liquid-water content measured. *Subject Headings:* **1. Cloud physics 2. Artificial clouds.**—*C.E.P.B.*

4.4–189 551.574.1:551.578.41

Schaefer, Vincent J. (*Gen. Elec. Res. Lab., Schenectady*), **Formation of ice crystals in ordinary and nuclei-free air.** *Industrial and Engineering Chemistry*, 44(6):1300–1304, June **1952.** 7 figs., 18 refs. **DLC**—Previous experiments showed that at −39°C large numbers of ice crystals form when an attempt is made to produce a supercooled cloud. Recent studies using ordinary and nuclei-free air to explore the factors that control the formation of ice crystals at various temperatures are described. The results indicate the relationship of freezing and fragmentation nuclei to the initial formation of ice crystals. The relationship of these findings to the formation of snow in the atmosphere is briefly mentioned. *Subject Headings:* **1. Ice crystal formation 2. Nuclei-free air.**—*Author's abstract.*

4.4–190 551.574.42

Itoo, K., **Mass, size and crystallizing velocity of skeleton-shaped depth hoar.** *Papers in Meteorology and Geophysics*, Tokyo, 2(2):189–190, June **1951.** 4 figs. **MH-BH**—The fundamental type of the depth hoar crystal is a hexagonal skeleton like twin prism. Individual crystals were made by sublimation on a hair exposed in the upper part of a well. The mass of a single depth hoar crystal $=6.30\times10^{-6}$g; the total area $=141\times10^{-2}$ cm²; the thickness of the ice wall: observed thickness $=34\mu$; calculated thickness from a microphotograph $=4.5\mu$. Crystallizing velocity along principal axis $=34\mu$/h, crystallizing velocity along lateral axis $=35\mu$/h; and mass of each stage of growth $=0.7\times10^{-6}$g. *Subject Heading:* **1. Hoar frost.**—*I.L.D.*

## FOG

4.4–191 551.575

Ward, A., **Fog at North Front, Gibraltar.** *Meteorological Magazine*, London, 81(963): 272–279, Sept. **1952.** 2 figs., 6 tables, 6 refs. **DWB**—Types of fog at Gibraltar are described. Monthly fog frequencies at North Front, Windmill Hill and Straits are given. Fog is related to sea temperature and wind. Diurnal variation is discussed. Some special occurrences are analyzed and forecasting fog considered. *Subject Headings:* **1. Fog frequencies 2. Fog forecasting 3. Gibraltar.**—*C.E.P.B.*

4.4–192 551.575.3

Markgraf, Hans, **Nebel auf der Unterelbe.** [Fog on the Lower Elbe.] *Wetterlotse*, 45:161–168, Oct. **1952.** 3 figs. **MH-BH**—Continuous observations of visibility $<1$ km were made 1939–1948 at 4 lightships and 7 lighthouses. Diagrams of annual and diurnal variation are given. At lighthouses maximum about sunrise (land fog), at lightships in later morning hours (land fog drifting seawards). *Subject Headings:* **1. Fog frequencies 2. Lower Elbe, Germany.**—*C.E.P.B*

## CLOUDS

*See also:* **Methodology of germ determination in air** (Reifferscheid), 4.4–56; **Apparatus for measuring clouds automatically** (Wingler), 4.4–60; **Life of a thundercloud** (Schüepp), 4.4–124; **Ice formation in water clouds** (Ehrenberg), 4.4–184; **Solid condensation nucleus not soluble in water** (Ogiwara), 4.4–187; **Continuous generation of cloud for lab. investigations** (Phillips), 4.4–188

4.4–193 551.576.1:551.515.4

Weiss, L. L., **Moisture accumulation rates in thunderstorm cells.** *American Geophysical Union, Transactions*, 33(1):13–20, Feb. **1952.** 13 figs., 6 tables, 2 refs., eqs. **DWB**—Limits to the duration and rates of moisture accumulation in thunderstorm cells are carefully estimated for ideal cells. Maximum moisture accumulation rates of about one in./hr are found for all models. *Subject Headings:* **1. Water content of clouds 2. Thunderstorms.**—*A.A.*

4.4–194 551.576.11:551.510.53

Farquharson, James Strachan, **Cloud in the stratosphere.** *Meteorological Magazine*, London, 81(965):341–345, Nov. **1952.** 3 figs., ref. **MH-BH**—Air with cloud at 47,000 ft over England Aug. 10, 1951, is traced back to Hudson Bay and was probably ice crystals. Other

American examples of saturation around 120 mb level are quoted. Upper air conditions over England on Aug. 10, 1951 are then examined, showing dynamic cooling in the layer in which the cloud formed. *Subject Heading:* **1. Stratosphere clouds.**—*C.E.P.B.*

4.4–195 551.576.11

Schirmer, Hans, **Beobachtungen von Wolkenstrassen.** [Observations of cloud lanes.] *Annalen der Meteorologie*, 5(1–2):57–59, **1952.** 4 refs. **DWB**—Systematic observations are needed. Two further cases are described, July 10, 1950, near Ingolstadt, WNW–ESE and July 29, 1950, near Hohenpeissenberg, WSW–ENE. Both travelled with the general air stream and had no relation to orography. *Subject Heading:* **1. Cloud lanes.**—*C.E.P.B.*

4.4–196 551.576.11:779

Waling, J., **Roll cloud.** *Meteorological Magazine*, London, 81(964):316–317, Oct. **1952.** photo. **DWB**—In N. Atlantic July 14, 1951, a very long roll cloud was observed in an otherwise cloudless sky. As it passed over, wind changed WSW–W–WSW and pressure rose sharply 1.4 mb. Roll decayed into a line of Cu. *Subject Headings:* **1. Roll clouds 2. North Atlantic.**—*C.E.P.B.*

4.4–197 551.576.4

Frost, R., **Cumulonimbus clouds over Sumatra.** *Meteorological Magazine*, London, 81(962):241–242, Aug. **1952.** table, ref. **MH-BH**—Measurements of cloud top height over Malaya and Sumatra May–June 1950 showed that many Cunb clouds exceeded 40,000 ft, one reaching 54,600 ft. Other similar observations are quoted. *Subject Headings:* **1. Cloud height 2. Cumulonimbus clouds 3. East Indies.**—*C.E.P.B.*

## PRECIPITATION

*See also:* **Rainfall distribution, Bulgaria** (Vranski), 4.4–14; **Meteorology at Armagh Observatory, Ireland** (Grew), 4.4–38; **Forecasting monsoon and winter rainfall, India** (Banerji), 4.4–71; **Heavy rains, July 15–17, 1951, S. Bavaria** (Reichel), 4.4–122

4.4–198 551.577:551.501.45

Cuthbertson, E. G. (*Agri. Exper. Sta., Trangie, Australia*), **Some rainfall characteristics at Trangie Agricultural Experiment Station.** *Australian Institute of Agricultural Science, Melbourne, Journal*, 18(1):19–21, March **1952.** 2 figs., 2 tables, 4 refs. **DLC**—Data on average rainfall and rainfall variability during the winter and summer period, on amounts per rain day during each season, on the seasonal frequency of maximum daily rainfall and on annual and seasonal frequency of rain-free periods are presented and commented on. The analysis is based on 33-year records. Water and wind erosion are discussed briefly. *Subject Headings:* **1. Rainfall data analysis 2. Long period records 3. Erosion 4. Trangie, Australia.**—*G.T.*

4.4–199 551.577.35(94)

Foley, J. C., **Interpretation of rainfall variability.** *Meteorological Magazine*, London, 81(965):325–333, Nov. **1952.** 6 figs., 3 refs. **MH-BH**—Methods of expressing variability of reliability of rainfall are discussed, including desirability of omitting extreme values, illustrated by cumulative frequency curves for Australian stations. Charts of Australia show: (semi-interquartile range)×100/median; 95% range×25/median, and MAURER's index. *Subject Headings:* **1. Rainfall variability 2. Australia.**—*C.E.P.B.*

4.4–200 551.577.1:551.573:551.571(47)

KHromov, Sergeĭ Petrovich, **K diskussii o vnutrennem vlagooborote.** [A contribution to the discussion on the internal moisture cycle.] *Vsesoiuznoe Geograficheskoe Obshchestvo, Izvestiia*, 83(5):500–506, Sept./Oct. **1951.** 10 refs. **DWB**—A critical review of current Soviet literature on the effect of evaporation from the surface of continents or parts thereof upon the amount of rainfall over the given area. Meteorological arguments are presented to demonstrate that external water vapor is much more important as a source of rainfall over the European U.S.S.R. than is internal water vapor. *Subject Headings:* **1. Rain formation 2. Evaporation 3. Water vapor 4. U.S.S.R.**—*I.L.D.*

4.4–201 551.508.85:551.577.1

§Cunningham, Robert M., **Some observations of natural precipitation processes.** *American Meteorological Society, Bulletin*, 32(9):334–343, Nov. 1951. 12 figs., 6 refs. **MH-BH**— Report on four flights arranged by the Signal Corps' M.I.T. Weather Radar Research Project with a view to investigating cloud and precipitation structures. Synoptic charts, radarscope photographs and a cross section of the lower atmosphere, with the radar echo and flight path indicated, are presented for each flight. The process of particle-growth is stated as taking place in five specified regions each corresponding to a phase in the process. These regions were investigated separately during radar flight observations. *Subject Headings:* **1. Radar analysis of precipitation 2. Precipitation formation 3. Cloud structure. I. U. S. Signal Corps. II. Massachusetts Institute of Technology Weather Radar Research Project.**—*G.T.*

4.4–202 551.577.2(262.53):551.515.1

Weickmann, Ludwig, **Auswirkungen sommerlicher Kaltlufttropfen als Beitrag zur Niederschlagsverteilung des Marmarameergebietes.** [Effects of summer cold air pools on the rainfall distribution over the Sea of Marmara.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:93–95, **1952.** 2 figs., 2 tables, 2 refs. **DWB**—The remarkable variability of summer rainfall at Istanbul (from 0 to 128 mm in a month) is related to the occasional passage of cold air depressions originating in the Etesian current and passing through the low pressure area over the Sea of Marmara. Examples July 20–23 and Aug. 20–23, 1951 *Subject Headings:* **1. Cold air bubbles 2. Rainfall distribution 3. Turkey.**—*C.E.P.B.*

4.4–203 551.577.3:551.506.3(433

*Reichel, Eberhard (*Munich*), **Die Niederschlagshöhen in München 1848–1950.** [The depth of precipitation in Munich 1848–1950.] 8 p. 3 tables, refs. Mimeographed. Supplt to: **Witterungskurzbericht für Bayern, April 1952. DWB**—A critical study. Careful comparison with neighboring station shows that the annual precipitation measured at Munich—Bogenhausen (Sternwarte) was 17% too low prior to 1883. Monthly and annual data are given for this station (1848–1950) and for Munich-Königsplatz (1879–1950). *Subject Headings:* **1. Long period records 2. Precipitation variations 3. Observational errors 4. Munich Germany.**—*A.A.*

4.4–204 551.577.32(969):551.513

Namias, Jerome and Mordy, Wendell A. (*Pineapple Res. Inst. of Hawaii*), **The February minimum in Hawaiian rainfall as a manifestation of the primary index-cycle of the general circulation.** *Journal of Meteorology*, 9(3):180–186, June **1952.** 11 figs., 7 refs. **DWB**— Most of Hawaii has a primary or secondary minimum of both trade and storm rainfall in Feb This is attributed to: 1) a cyclic increase in the diameter of the circumpolar vortex at 700 mb over the Pacific, with a corresponding weakening of the trades, and 2) a lengthening of the wave pattern which (the trough off Asia being fixed) takes the upper trough in E. Pacific to the east of Hawaii, and decreases frequency of kona storms. *Subject Headings:* **1. Precipitation anomalies 2. Zonal circulation 3. Hawaiian Islands.**—*C.E.P.B.*

4.4–205 551.577.32:634.94:529

Schulman, Edmund, **Dendrochronology in Big Bend National Park, Texas.** *Tree-Ring Bulletin*, Tucson, Arizona, 18(2/3):18–27, Oct. **1951**/Jan. **1952.** 6 figs., table, refs. **MH-BH**— Thirteen specimens of Douglas-fir from the Chisos Mountains south of Marathon, Texas, were measured. Their center dates vary from 676 to 845. Mean ring-widths of 5 trees from 1700 to 1945 are tabulated and compared with winter and summer rainfall data. Comparison is also made between early wood and late wood trees and with Douglas-fir trees in New Mexico. The author concludes that a significant relationship appears to exist between the growth of trees and winter rainfall. The effect of summer rainfall is not yet provable. No regular recurrence of wet or dry winters can be observed. *Subject Headings:* **1. Rainfall influences 2. Dendrochronology 3. Winter rainfall 4. Texas.**—*G.T.*

4.4–206 551.577.33

Drummond, A. J. (*Weather Bureau, Pretoria*), **Remarks on "Persistence of extremely wet and extremely dry months in the United States."** *Monthly Weather Review*, 80(1):5–6, Jan. 1952. Reply by C. S. Gilman and J. T. Riedel, p. 6. **MH-BH**—In reference to the article quoted in the title (*see item* 2.11–146, Nov. 1951, *MAB*), the author points out that Gilman's and Riedel's conclusions regarding a "persistence for wet and dry months" in England do not agree with the results obtained by the author and associates who used what he author claims to be "certainly the most homogeneous long-period rainfall records existing or the British Isles." In their reply Gilman and Riedel venture the argument that they elt "more weight should be given to the results of tests that do show significance" which they ffer as a justification for having based their conclusions on earlier and less complete records ather than those collected by Beer, Drummond and Fürth. *Subject Headings:* **1. Persistence . Precipitation variations 3. Precipitation extremes 4. United States 5. British Isles. . Gilman, C. S. II. Riedel, J. T.**—*G.T.*

4.4–207 551.577.37:633(411)

Walton, Kenneth, **Climate and famines in north-east Scotland.** *Scottish Geographical Magazine*, 68(1):13–21, April 1952. 30 refs. **DWB**—Reviews the famines in the north-east owlands in 17th and 18th centuries due mainly to poor oat crops resulting from late frosts, eavy rains in summer, and floods. Notable were the "Seven Ill Years" (1694–1700) and 779–1782. Resulting changes in population and practice (e.g., introduction of potato), escribed. *Subject Headings:* **1. Excessive precipitation 2. Crop yield 3. Scotland.**—*C.E.P.B.*

4.4–208 551.577.37:551.515.22(52)

Yoshino, I., **On the heavy rainfall in Shikoku District accompanying the tropical storm f Aug. 1948.** *Journal of Meteorological Research*, Tokyo, 3(5):157–165, March 1951. 9 figs., able. In Japanese, English summary p. (12). **DWB**—The heavy rainfall resulted from the -N disturbance of a W-E trough. The NP maritime air mass on the north side of the trough hich seemed to come from the Arctic anticyclone stayed in the Sea of Okhotsk for a week and aused the heavy rainfall by damming up the equatorial maritime air accompanying the ropical storm. *Subject Headings:* **1. Excessive rainfall 2. Tropical cyclones 3. Shikoku District, Japan.**—*I.L.D.*

4.4–209 551.577.5(47)

Zhakov, S. I., **Nekotorye dannye o proiskhozhdenii atmosfernykh osadkov Nizhnego Povolzh'ia v letniĭ period.** [Some data on the source of atmospheric precipitation in the Lower Volga Area during the summer period.] *Vsesoiuznoe Geograficheskoe Obshchestvo, USSR, Izvestiia*, 84(1):36–42, Jan.–Feb. 1952. 3 figs., 2 tables. **DLC**—Precipitation data or Stalingrad are analyzed. Most precipitation in this area comes from continental tropical ir, saturated with water vapor, over the Caspian Sea. The tropical air from the Black and Mediterranean Seas has little influence on precipitation in Stalingrad. Weather maps are iven for typical cases. Forty-two percent of all precipitation is connected with the action f the polar front. *Subject Headings:* **1. Precipitation sources 2. Stalingrad, U.S.S.R.**—*A.A.*

## SNOW

*See also:* **Snow melting systems design** (Chapman), 4.4–74; **Snow melting system practice and design** (McKinley), 4.4–76; **Climatological data analysis for spring cloud seeding, N. Central Colo.** (Resnick), 4.4–81; **Long wave radiation from snow packs** (U. S. Corps of Engineers and Weather Bureau), 4.4–132; **Ice crystal formation in nuclei-free air** (Schaefer), 4.4–189

4.4–210 551.578.4:551.588.7

von Kienle, J., **Ein stadtgebundener Schneefall in Mannheim.** [A local snowfall in Mannheim.] *Meteorologische Rundschau*, 5(7/8):132–133, July/Aug. 1952. 2 figs. **DWB**—an. 28 and 30, 1949, snow fell at Mannheim but surrounding country had mostly clear skies. onditions were calm anticyclonic with a large surface inversion and fog. Attributed to

impregnation of fog and low stratus by chemical impurities from the factories, raising freezing point of supercooled droplets. *Subject Headings:* **1. Snow 2. Urban influences.**—*C.E.P.B.*

4.4–211 551.578.41:551.311.12

de Quervain, Marcel (*Davos*), **Zur Entstehung der Lawinen.** [Formation of avalanches.] *Leben und Umwelt*, Aarau, Switz., 7(6):121–131, March **1951.** 8 refs. **DLC**—The author studied the mechanical properties of snow (dependence of breaking modulus on temperature for different granulations of snow, friction, elasticity, plasticity, etc.) and the peculiarity of snow as crystalline material. He classifies avalanches as of two principal types—those formed by noncompact snow and those formed from packed snow. The formation of wet or dry snow is distinguished for each type. *Subject Headings:* **1. Snow structure 2. Avalanche formation.**—*N.T.Z.*

4.4–212 551.578.41:001(09

Itō, Kyōji, **A note on diamond dust.** *Meteorological Society of Japan, Journal, 2nd Ser.* 29(9):311–313, Sept. **1951.** table. In Japanese, English summary p. 313. **MH-BH**—Various terms for ice crystals in the air are set out historically (1681–1951) and their definitions classified. *Subject Headings:* **1. Ice crystals 2. Definitions.**—*C.E.P.B.*

4.4–213 551.578.45/6(52

Kikuchi, Tetsuo, **On snowstorm types in Iwate Prefecture.** *Iwate Meteorological Association, The Review*, p. 1–8, Nov. **1951.** 14 charts, table. In Japanese, English summary appended p. 1–2. **DWB**—Data for 15 instances of heavy snowfalls which occurred during the period 1923–1947 are presented and analyzed. Snow cover charts and charts on synoptic situations connected with heavy snowfall are presented. Author discriminates between inland type and mountain type snowfall and finds that the majority of snowfalls in Iwate Prefecture are caused by winter monsoon but the heaviest falls in the interior occur with a warm front passage. *Subject Headings:* **1. Snowstorms 2. Snow cover 3. Monsoon snowfall 4. Warm front 5. Iwate Prefecture, Japan.**—*G.T.*

4.4–214 551.501:551.578.4

Dona', Ferdinando, **Programma di studio e nota preliminare sulla distribuzione altimetrica del manto nevoso e delle precipitazioni nevose nella regione Veneta.** [Program of study and preliminary note on the vertical distribution of snow cover and of the snow fall in the Veneta Region.] *Padua. Università. Istituto di Geodesia i Geofisica, Pubblicazioni, New Ser.*, No. 1/5 [**1951?**]. 11 p. tables, 2 figs., 11 refs. Reprint from: *Congresso Geografico Italiano, XV, Turin, 1950, Atti.* **DWB**—After setting out a research program for an area of 18,000 sq km using 236 stations some preliminary values of snowfall amount and duration of snow cover up to highest levels are set out for 5 regions (upper Adye to western Venice). *Subject Headings:* **1. Snow surveys 2. Veneta Region, Italy.**—*C.E.P.B.*

4.4–215 551.578.46:551.57

Richardson, W. E., **Ablation of snow deposits at Alston, Cumberland.** *Meteorological Magazine*, London, 81(961):217–218, July **1952.** fig. **DWB**—Daily observations in Feb 1952 are given, showing height of snow line, depth of snow (maximum drift and general), wind, temperature and precipitation. Depletion of snow occurred mainly with strong winds. *Subject Headings:* **1. Ablation 2. Alston, Cumberland.**—*C.E.P.B.*

4.4–216 551.578.4

Streiff-Becker, R., **Probleme der Firnschichtung.** [Problem of firn stratification.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, 2(1):1–9, **1952.** 4 figs., 2 photos. **DLC**—Each Sept. firn surfaces on Swiss glaciers were marked by coloring matter and the annual thickness growth measured in pits. The changes in structure with depth under radiation and temperature, movement and pressure of overlying firn are discussed. *Subject Heading* **1. Firn.**—*C.E.P.B.*

4.4–217 551.578.46:72

U. S. Housing and Home Finance Agency, **Snow load studies.** *U. S. Housing and Home Finance Agency, Housing Research Paper*, No. 19, May **1952.** 19 p. 9 figs., 8 refs. **DWB**—Report on a project sponsored by the Housing and Home Finance Agency and carried out by U. S. Weather Bureau. Object of the project was to evaluate available Weather Bureau data with respect to snow loads for which different types of building construction should be prepared for various parts of the U. S. Data on maximum water equivalent in relation to seasonal snowfall, on maximum depth of snowpack versus maximum water equivalent, on regional maximum snowfall distribution, on the relation 10-year seasonal snowfall to mean seasonal snowfall, on effective areas of controlling snowstorms, on load of snow, etc., are presented in charts and graphs. Application to architectural problems is considered briefly. *Subject Headings:* **1. Snow cover effects 2. Building design 3. Water content of snow. I. U. S. Weather Bureau.**—*G.T.*

## HYDROMETEOROLOGY

*See also:* **Flood and tornadoes mark early spring** (Ludlum), **4.4–113; Hydrodynamic theory of wind desiccation** (Slezkin), **4.4–183**

4.4–218 551.579.5:581.1

Ellenberg, H., **Beurteilung der Bodenfeuchte mit Hilfe von Pflanzengesellschaften.** [Evaluation of soil moisture by means of plant associations.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 32:13, **1952. DWB**—Short abstract of a report from the Agrometeorological Conference concerning plants serving as moisture indicators. *Subject Headings:* **1. Soil moisture 2. Plant ecology 3. Germany.**—*A.A.*

4.4–219 551.579.5:631.4

Fletcher, Peter W. (*Univ. of Missouri, Columbia*), **The hydrologic function of forest soils in watershed management.** *Journal of Forestry*, Wash., D. C., 50(5):359–362, May **1952.** 5 figs., 8 refs. **DLC**—Factors influencing the soil water storage are briefly discussed. The natural forest soil is the hydrologic ideal from a flood control standpoint. *Subject Headings:* **1. Soil moisture 2. Forest influences.**—*A.A.*

4.4–220 551.579.5:551.508.79

Geiger, Rudolf, **Bericht über ein von G. Hofmann entwickeltes Gerät zur Registrierung der Bodenluftfeuchtigkeit.** [A report about an apparatus used for measurement of soil humidity developed by G. Hofmann.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 32:24–27, **1952.** 3 figs., 9 refs. **DWB**—An apparatus, sensitive at high relative humidity, is described. The measuring element is a cellophane sheet. A close relationship exists between the relative air humidity in the soil and the suction power of the soil. *Subject Headings:* **1. Soil moisture measurement 2. Soil moisture instruments. I. Hofmann, G.**—*A.A.*

4.4–221 551.579.5:551.573

†Kramer, Paul J. (*Duke Univ., Durham, N. C.*), **Plant and soil water relations on the watershed.** *Journal of Forestry*, Wash., D. C., 50(2):92–95, Feb. **1952.** 24 refs. **DLC**—A concise review on soil-water relations, vegetation in relation to water storage, factors affecting transpiration and total water loss. Valuable references are given. *Subject Headings:* **1. Evapotranspiration 2. Soil moisture 3. Forest influences.**—*A.A.*

4.4–222 551.579.5

Kusakabe, M., **On the seasonal change of soil moisture.** *Journal of Agricultural Meteorology*, Tokyo, 7(1):4–6, Dec. **1951.** 2 figs., 8 refs. In Japanese, English summary, p. 6. **DWB**—This study is based on soil moisture recordings at Owada for the period 1948–1950. In the seasonal change of surface soil moisture two maxima are observed, one in Jan.–Feb. and one in June. The minimum occurs in July or August. A similar variation was observed at depths of 5, 10 and 20 cm, but within a narrower range. Some changes at depths of 50 and

100 cm are mentioned. Annual and monthly frequency curves of soil moisture are presente
*Subject Headings:* **1. Soil moisture variations 2. Owada, Japan.**—*G.T.*

4.4–223 551.579.5:631

Ogg, Sir William, **Modern developments in soil science.** *Royal Society of Arts, Journ* 100(4870):365–381, April 4, **1952.** Discussion p. 377–381. **GB-MO**—Includes: soil classific tion and soil surveys, the study of soil clay and humus, soil-water-plant relations (includi drainage and evaporation), soil fauna and microorganisms. *Subject Heading:* **1. Soil moistur** —*C.E.P.B.*

4.4–224 551.579

Razumova, L. A., **Migratsiia vlagi v pochve po dannym laboratornykh opytov.** [Mov ment of moisture in the soil according to experimental data obtained in the laboratory *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Informatsionnyĭ Sborni* 1:98–108, **1951.** figs., 5 tables, 3 refs. **DLC**—Special experimental investigations have bee made in the town of Mamontovo, Kuntsevo region, Moscow district, and it has been foun that during the freezing of the soil the characteristics of soil moisture are of a paramou importance in the internal migration of moisture in soil. In dry soils the migration of moistu occurs only in a vapor form. In moist soils the upper layers are enriched by moistu at the expense of lower, later freezing layers. The capillary inflow of water from outsi (the bottom of soil sample was placed in contact with water table) was very great durin the freezing process and all layers were enriched by water. *Subject Headings:* **1. Soil moistu 2. Soil freezing.**—*N.T.Z.*

4.4–225 551.579.5:551.586:631

Schrödter, H., **Bodenfeuchtigkeitsmessungen in einer Himbeerparzelle mit unterschiedlic behandelten Teilstücken. (Beitrag zur Frage des Einflusses von Kulturmassnahmen a die Bodenfeuchtigkeitsverhältnisse.)** [Soil moisture measurements in a raspberry plot wit strips differently treated. (Contribution to the question of the influence of cultivation o soil moisture conditions.)] *Angewandte Meteorologie*, 1(3):92–94, Dec. **1951.** 2 figs., 2 ref **DWB**—In investigating death of raspberry canes a plot 20×13 m was divided into 4 strip 1) treated with stable manure and watered; 2) watered; 3) unwatered; 4) manured but u watered. Soil moisture (mean 10–50 cm) was measured daily in June 1950; isoline-time plo shows that both manure and watering raised soil moisture about equally but there was als transfer of moisture from one strip to the next. *Subject Headings:* **1. Soil moisture 2. Bio climatology.**—*C.E.P.B.*

4.4–226 551.579.5:551.588

Trombe, Félix, **L'alimentation en eau des terres arides.** [Water supply for arid soil *France. Centre National de la Recherche Scientifique, Journal des Recherches*, No. 19:189–19 June **1952.** 7 figs., 2 tables. 12 refs. **DWB**—Ground water in arid regions frequentl contains strong saline solutions which make it unsuitable for nutrition of plants. Two differe techniques of water production in such regions, one based on condensation of atmospher moisture by letting air pass through a cooling apparatus and the other using an apparatus fo distillation of salt water by means of solar energy, are suggested and explained in detail. Th correlation between temperature, humidity, vapor pressure and condensation is analyzed i graphical and tabular form. Annual and diurnal condensation cycles in large subterranea rock formations, which change the temperature of the outside air while it passes through them are discussed and data presented on the amount of condensation occurring in such large scal processes. *Subject Headings:* **1. Ground water 2. Arid zones 3. Artificial condensation.** *G.T.*

4.4–227 551.579.5(52):551.501.4

Umetani, H., **On the estimate of the soil moisture contents during the nonprecipitatio periods.** *Journal of Agricultural Meteorology*, Tokyo, 7(1):9–10, Dec. **1951.** 3 figs., 9 refs 5 eqs. In Japanese; English summary, p. 10. **DWB**—As a result of the consideration o the dryness of the soil surface, the following formula is obtained $y=y_{o}e^{-\Phi(T)t}$, where $y$ is th

oisture content on the soil surface, $T$ the temperature of the soil surface, $t$ the time measured ounted by day in this case and $y_{oe}$ is a constant. From the data of the soil moisture content 1947–1950) except for the freezing periods at the Owada, Saitama, the following empirical rmula is obtained by the least squares $\Phi(T) = 1/10e^{-3.39+0.07T}$. Using these results it will be ossible to estimate the soil moisture content of the soil surface during the non-precipitation eriods. *Subject Headings:* **1. Soil moisture 2. Soil temperatures 3. Japan.**—*Author's bstract.*

4.4–228 551.579.5

Unglaube, E., **Ergebnisse der Bodenfeuchtigkeitsmessungen in Geisenheim.** [Results f soil moisture measurements in Geisenheim.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:198–201, **1952.** 3 figs., 2 tables, 2 refs. **DWB**—Weekly measurements of soil moisture by weight in different types of soil under different crops, down to 1 m, n 1950 and 1951 are analyzed in relation to rainfall, and the loss of water calculated. *Subject Headings:* **1. Soil moisture 2. Geisenheim, Germany.**—*C.E.P.B.*

## CLIMATOLOGY AND BIOCLIMATOLOGY

### CLIMATOLOGY

*See also:* **Physics of Mars** (de Vaucouleurs), 4.4–4; **Meteorology, climatology** (Kostin), 4.4–8

4.4–229 551.58:6

Knoch, Karl, **Die angewandte Klimatologie im Rahmen des Wetterdienstes.** [Applied imatology in the Weather Service.] *Germany. Deutscher Wetterdienst in der US-Zone, erichte*, No. 38:435–440, **1952.** 15 refs. **DWB**—The basis of applied climatology is a ound organization of reports from climatological stations, combined in charts, atlases and onographs. The subject falls into: agricultural meteorology, biometeorology and technical industrial (including chemical) climatology. *Subject Heading:* **1. Applied climatology.**—*E.P.B.*

4.4–230 551.58:551.501(47)

Selianinov, G. T., **O klimatologicheskom izuchenii SSSR.** [On climatological investigaon of the USSR.] *Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia*, 84(1):80–85, an.–Feb. **1952.** 8 refs. **DLC**—The Main Hydrometeorological Service's official plan for imatological investigations, based on KH. P. POGOSIAN's theory of physical climatology, is iticized. More attention must be given to practical investigations, especially those for the evelopment of agriculture. The existing network is oriented more toward synoptic needs and inadequate for many practical purposes. *Subject Headings:* **1. Climatological research U.S.S.R. I. Pogosian, KH. P.**—*A.A.*

4.4–231 551.58:019.941

Selianinov, G. T., **A. I. Voeĭkov. Izbrannye sochineniia.** ["Collected works of A. I. oeĭkov."] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Informatsionnyĭ bornik*, 1:144–150, **1951.** 5 refs. **DLC**—A critical review, stating the importance of the new dition of the works of VOEĬKOV (*see item* No. 3.4–4, April 1952, *MAB*) whom the author onsiders as the acknowledged founder of climatology as a science and the pride of Russian cientific thought. He indicates that the works of VOEĬKOV were unjustly forgotten by ussian scholars, because the methodology of VOEĬKOV differed from the metaphysical one hich was generally accepted in VOEĬKOV's time. But the contemporary Soviet climatologists re also accused of not using the rich material left by VOEĬKOV in the "Course of Climatology" sued in 1941 by several authors. The latter is extremely onesided and deprived of that epth which is characteristic of VOEĬKOV's work "The climates of the Globe." These Soviet imatologists did not mention any work of VOEĬKOV in the bibliography attached to the Course of Climatology." Furthermore S. P. KHROMOV did not mention the works of VOEĬKOV his book "The fundamentals of synoptic meteorology" nor did KHRGIAN in his "Outlines

of history of meteorology" which were published in 1948. They forgot the fact that Voeĭkov is the creator of the concept and teaching about the atmospheric circulation as a climate forming factor. "The Climates of the Globe," is a necessary guide for the study of world climates and therefore a specially attentive editing and supplementary comments are necessary in order to bring it in focus with the present state of knowledge and to avoid the editorial defects in the original text. This requirement was not met by the editorial remarks in this new edition. Numerous instances of editorial faults are cited. *Subject Headings:* **1. History of climatology 2. Reviews. I. Voeĭkov, Aleksander Ivanovich. II. Grigor'ev, A. A.** (*ed.*). —*N.T.Z.*

## CLIMATE OF PARTICULAR PLACES

*See also:* **Artificial precipitation and possible application in Sardinia** (Serra), **4.4–83; Bibliography on climate of Australasia, p. 481–528.**

4.4–232 551.582:551.3(83)

Borde B., Jean, **Datos sobre el paisaje climático del valle del Puange.** [Data on the climatic features of the Puangue Valley.] *Chile. Universidad. Instituto de Geográfia, Informaciones Geográficas,* 1(1):4–11, April **1951**; 1(2):26–33, July **1951.** maps, table, 2 photos, diagr. **DWB**—In Chap. 1 of this essay on the Puangue valley, situated in the coastal Cordillera Mountains between Santiago and the Pacific, monthly totals of rainfall from 1946 to 1950 are tabulated and commented on. The other chapters deal with geological and orographic characteristics of the region and their palaeoclimatological causes, with general aspects of watersheds and runoff, with the composition of soil and vegetation and with erosion especially as far as it is due to human activity. *Subject Headings:* **1. Rainfall data 2. Climatic effects 3. Puangue Valley, Chile.**—*G.T.*

4.4–233 551.582(262):656.6

Great Britain. Hydrographic Office, **Mediterranean pilot, Vol. 1. Comprising the southern and eastern coasts of Spain from Gibraltar to Cap Cerbère; Islas Baleares; Sardinia; the northern coast of Africa from Ceuta to Ras Ajdir; Isola di Pantellaria and Isole Pelagie; the Maltese Islands; Isole Egadi; Sicily and Isole Eolie.** 8th ed. **1951.** 547 p. 73 plates. **GB-MO**—Includes meteorological text and climatic descriptions p. 29–61 and standard climatic tables for ports. *Subject Headings:* **1. Pilot guides 2. Mediterranean Sea.**—*C.E.P.B.*

4.4–234 551.582(941)

Hennely, J. P. F., **The Manjimup District, W.A.** *Western Australia. University. Geographical Laboratory, Research Report,* No. 29, Sept. **1951.** 10 p. refs. **MH-BH**—Contains brief summary of climatic features of this district—the rainiest in Western Australia. Very little data is available. Average annual rainfall for Lake Muir, Manjimup and Pemberton is 32, 43 and 52 in., respectively. Map shows location of district and 60" annual isohyet. *Subject Headings:* **1. Climate of Australia 2. Western Australia.**—*M.R.*

4.4–235 551.582.1:551.506.1(45)

Bernacca, Edmondo, **Il tempo in Italia nel semestre aprile-settembre 1951.** [The weather in Italy in the period April–Sept. 1951.] *Rivista di Meteorologia Aeronautica,* 11(3/4):45–49, July/Dec. **1951. MH-BH**—A month by month account of average and extreme weather conditions throughout Italy, beginning with synoptic conditions prevailing during the month, and followed by a discussion of mean and extreme temperature and precipitation in various parts of Italy and island possessions. This is a regular feature of the journal. *Subject Headings:* **1. Weather conditions 2. Monthly summaries 3. Italy.**—*M.R.*

4.4–236 551.582.1(711)

Kerr, Donald, **The climate of British Columbia.** *Canadian Geophysical Journal,* 45(4): 143–158, Oct. **1952.** 18 figs. **DWB**—A nice study of the climatic characteristics of five different arbitrary (so called climatic) regions of British Columbia. In each region there are many climatic types because of the extremely varied topography. The vast province is divided into (A) South-West British Columbia (Vancouver, Victoria and Straits of Georgia), (B) Coastal, B. C. (Vancouver Island and Coast as for North as Prince Rupert), (C) Fraser

Uplands and Valleys, (D) Columbia Rocky Mountains and Valleys, and (E) Northern B. C. (over half of the territory.) Discussion includes air masses, fronts and storms, snow temperatures, precipitation and effect of them on vegetations. Several charts, many excellent photographs and some condensed meteorological tables (7 selected stations) provide illustrative material for this popular article. *Subject Headings:* **1. Climate of British Columbia 2. British Columbia.**—*M.R.*

4.4–237 551.582.2(777)

Iowa. State College of Agriculture and Mechanic Arts, **Climate of Iowa.** [1952] 5 Pts. (Pt. 1, 34 p., other parts unpaged.) figs., tables, charts, refs. Mimeographed and typescript. **DWB**—The climate of Iowa is being compiled as a series of separate statistical studies of individual weather as determined from observations at scores of stations evenly distributed throughout the state. The first part is an excellent study of the probability of occurrence of freezing temperatures of varying degrees ($<32°$, $<28°$, $<24°$ and $<16°$F) in the fall and spring. Part II is a similarly elaborate study of probability of daily minimum temperatures (of all degrees) and Part III the daily maximum temperatures, Part IV the probable duration of given temperatures, Part V soil temperatures in relation to air temperature, and Part VI probable rainfall amounts. A list of publications and weather summary previously published by the U. S. Weather Bureau at Des Moines is attached, a large number of useful charts, nomograms and tables are included. *Subject Headings:* **1. Climate of Iowa 2. Freezing temperature probabilities 3. Iowa. I. Shaw, Robert H. II. Thom, Herbert C. S. III. Barger, Gerald L.** —*M.R.*

## CLIMATIC CHANGES

4.4–238 551.583.14(43) 551.524.35

Conrad, Victor, **Climatic changes or cycles?** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):109–121, **1952.** fig., 8 tables, 8 refs. English, German and French summaries p. 109–110. **DWB**—Sums of daily mean temperatures below 0°C at Berlin Nov.–March are calculated for each year 1767–1946; mean 233°C, $\sigma$ 154°C. Cold winters are defined as sums above 387, mild below 79, and listed. Possible recurrences of abnormal winters are examined in various ways but the results show no periodic features, depending mainly on the criteria of cold and mild winters. There is however a clear secular change, cold winters being fewer and mild winters more frequent since 1870. *Subject Headings:* **1. Climatic trends 2. Abnormal winters 3. Berlin, Germany.**—*C.E.P.B.*

4.4–239 551.583.14:551.311.12(786)

Dightman, Richard A. (*Helena, Mont.*) and Beatty, M. E. (*Glacier Natl. Park, Mont.*), **Recent Montana glacier and climate trends.** *Monthly Weather Review*, 80(5):77–81, May **1952.** fig., 3 tables, 12 refs. **MH-BH**—After receding for over 40 years, the remaining glaciers in Glacier National Park, Montana, have been advancing for several years (cool, wet period). Present and past methods of measurement and research on these glaciers from the ground and air, are explained in detail. Precipitation and temperature records for Montana are analyzed and related to glacier variations. If this reversal in the secular trend continues for a decade or so, it will bear out WILLETT's forecast based on relationships between sunspot activity and climatic changes. *Subject Headings:* **1. Glacier variations 2. Climatic variations 3. Glacier Park, Montana.**—*M.R.*

4.4–240 551.583.3

Cyr, Donald Lee, **Greenhouse world.** Pasadena, Annular Publications, **1950.** 52 p. 11 figs., 4 tables, 16 refs. **DLC**—A popular exposition of the theory advanced by MARSDEN MANSON regarding the screening effect of a cloud canopy at great heights in the earth's atmosphere, on the climate of various geologic areas. The argument is essentially that there have been 3 basic types of climate: 1) glacial, 2) modern and 3) canopy type. The modern type is one in which temperatures alternate from high to low and moisture varies from time to time and place to place. The canopy type, caused by annular rings of clouds such as are on Jupiter, was characterized by constant high temperature, heavy rain and high humidity. Astronomical, geological and botanical evidence is given. *Subject Headings:* **1. Climatic changes 2. Paleoclimates.**—*M.R.*

4.4–241 551.583.3:59

Herre, Wolf, **Der Einfluss der Eiszeit auf die Formbildung in der Tierwelt.** [The influence of the Ice Age on the development of animal species.] *Umschau*, 52(20):609–610, Oct. 15, 1952. **DLC**—A brief general discussion of the effect of the forced migrations of the Quaternary in speeding up evolution. *Subject Headings:* **1. Glacial periods 2. Animals.**—*C.E.P.B.*

4.4–242 551.583.3

Hollingworth, S. E.; Linton, D. L., **A note on the use of marginal drainage in the recognition of unglaciated enclaves.** *Journal of Glaciology*, 2(12):107–109, Nov. 1952. **DWB**—Includes a note on Ice Age climate of unglaciated areas in England: very cold but dry, owing to small snowfall. *Subject Headings:* **1. Quaternary climates 2. England.**—*C.E.P.B.*

4.4–243 551.583.3:571

Ovey, Cameron Darrell, **Archaeology and the meteorology of the past.** *Weather*, 7(6):184–185, June 1952. **DWB**—Summary of lecture by Gordon Manley on archeological evidence for Late Glacial and Postglacial changes of climate. *Subject Heading:* **1. Quarternary climates.**—*C.E.P.B.*

4.4–244 551.583.3:551.311.12

Paschinger, Herbert, **Die spätglazialen Gletscher des Gschnitztales.** [The late-glacial glacier of the Gschnitz valley.] *Zeitschrift für Gletscherkunde und Glazialgeologie*, 2(1):35–57, 1952. 2 maps, 39 refs. **DLC**—The late glacial moraines and terraces of the Schlern glacier since 20,000 B.C., indicate a readvance after the Alleröd oscillation, then a continuous retreat broken by many minor oscillations and two major halts—Daun and Egessen stadia. *Subject Headings:* **1. Quaternary climates 2. Alps.**—*C.E.P.B.*

## MICROCLIMATOLOGY

*See also:* **Plant growth and climate, Mt. Etna** (Knoll), **4.4–249**

4.4–245 551.584.2:551.588.6(434)

Kreutz, W. and Schubach, K. (*Giessen*), **Lokalklimatische Geländekartierung der südlichen Bergstrasse unter besonderer Berücksichtigung der Gemarkung Heidelberg.** [Terrain mapping of local climate in the southern Bergstrasse with particular reference to the cultivated area around Heidelberg.] *Germany. Deutscher Wetterdienst in der US-Zone, Mitteilungen*, No. 13, April 1952. 11 p. 5 figs., 14 refs., 4 charts. **DWB**—A model microclimatic investigation of a small agricultural area of about 38 sq km based upon 37 observation points at which air temperature and rainfall were measured. Minimum temperatures were measured at a height of 50 cm and rainfall at a height of 1 m. Soil temperatures were measured at three points: at the foot of the mountain, on the slope, and in the valley. The relationship of air temperature to radiation and terrain, the variations of soil temperature and the distribution of rainfall are analyzed and maps giving isotherms on clear nights and on cloudy nights are appended. *Subject Headings:* **1. Local climatology 2. Vegetation influences 3. Bergstrasse, Germany.**—*I.L.D.*

4.4–246 551.584.42:546.264

Huber, Bruno, **Der Einfluss der Vegetation auf die Schwankungen des $CO_2$-Gehaltes der Atmosphäre.** [The influence of vegetation on the variations of the $CO_2$ content of the atmosphere.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):154–167, 1952. 7 figs., 2 tables, 22 refs. German, English and French summaries p. 154–155. **DWB**—An infrared absorption recorder was used to measure diurnal variation of $CO_2$ 1–22½ m above a wheatfield near Munich in June. Variation greatest at 1 m, ranging in fine weather from 30%, at 18 h to 48 at 4½ h. This is due to accumulation by respiration at night, absorption by photosynthesis and mixing by turbulence during day. Observations by balloon show that at 100 m variation is greatly damped and retarded. The net transport is downward, greatest about noon, and of correct order to balance photosynthesis and respiration. *Subject Headings:* **1. Carbon dioxide 2. Vegetation influences.**—*C.E.P.B.*

4.4–247 551.584.6:551.586:551.521

Seemann, J., **Strahlungsverhältnisse in Gewächshäusern.** [Radiation conditions in greenhouses.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):193–206, **1952.** 8 figs., table, 10 refs. German, English and French summaries p. 193–194. **DWB**—This discussion of the light and heat climate of greenhouses compared with open is based on numerous records in North Rhine-Westphalia, including spectral transmission of window glass and greenhouse glass. The latter transmits more light and heat. Transmission decreases with angle of incidence, other losses are from framework (10%), artificial shading in summer (30–50%), and dirty panes (up to 50%). In winter insufficient light is transmitted. *Subject Heading:* **1. Greenhouse temperatures.**—*C.E.P.B.*

4.4–248 551.584.61

Kliugin, S. A. and Malysheva, A. E., **K voprosu o normirovanii podvizhnosti vozdukha na predpriiatiiakh tekstil'noĭ promyshlennosti.** [The problem of standardization of air movement in textile factories.] *Gigiena i Sanitariia*, Moscow, No. 5:22–28, **1952.** 2 figs., 4 tables. **DLC**—The author analyzes the sources of air movement in spinning and weaving mills and the distribution of wind velocities in work rooms when ventilation is provided by air currents emanating from ventilators in walls. Formulas for calculating air movement in the work zone and effectiveness of air currents are presented: $v \simeq \frac{0.516\ L_0}{R_0\sqrt{F_n}}$ m/sec. $R_0$ = radius of tube; $v$ = average velocity of air current in work zone; $L_0$ = air flow through indraft tube m/sec; $F_n$ = area of cross section of work rooms in m²; and $S_{0.40}$ = distance from place of discharge of air to point where the air current reaches 40% of the area of the work room. Also a table giving suitable air velocities for various air temperatures is given. $S_{0.40} = \frac{0.71\sqrt{F_n} - R_0}{0.34} m.$ *Subject Headings:* **1. Industrial climatology 2. Indoor climates.**—*I.L.D.*

## CLIMATIC CLASSIFICATION

*See also:* **Climatic physiology** (Loewy), 4.4–255

4.4–249 551.585.7:551.584.43(458)

Knoll, Friedl (*Vienna*), **Pflanzenwuchs und Klima auf dem Aetna.** [Plant growth and climate on Mt. Etna.] *Wetter und Leben*, 4(3/4):52–55, April **1952.** **MH-BH**—The extreme sparsity of vegetation and the fewness of species at the upper elevations of Mt. Etna are the result of climatic and edaphic conditions. The characteristic species, the climate (temperature, radiation and moisture conditions), and the factors preventing soil formation are described. Climate and edaphic conditions determine the type and extent of the vegetation in the absence of biotic factors such as competition and mutual protection. *Subject Headings:* **1. Mountain climates 2. Plant ecology 3. Mt. Etna, Sicily.**—*I.L.D.*

4.4–250 551.585.7:551.311.12(436)

Tollner, Hanns, **Die Sonnblickgletscher in den Jahren 1938 bis 1951.** [Sonnblick glaciers during the period 1938 to 1951.] *Sonnblick-Verein, Vienna, Jahresbericht*, 48:6–18, **1950.** 3 figs., 4 tables, 13 refs. **DWB**—Traces of mining activities in early historical and medieval times and references found in medieval documents lead to the conclusion that the glaciers at that time occupied much less space than at present. Areal development of the Goldberg glacier since its peak in 1850 is discussed and shown on a map. Data for the variation in size of the Goldberg, Wurtenkees and Fleisskees glaciers are presented on tables for the period 1896–1950. Photos show the Goldberg glacier in 1938 and in 1949, marking considerable regression. Recent development of several glaciers is described and their regression discussed in conjunction with climatic factors. Results of measurement of the density of permanent snow since 1908 are indicated. *Subject Headings:* **1. Glacier formation 2. Glacial ablation 3. Sonnblick, Austria.**—*G.T.*

4.4–251 551.585.7:551.524.36(798)

§Washburn, Bradford (*Boston Museum of Science, Mass.*), **Mount McKinley weather experiences.** *Weatherwise*, 5(1):3–7, Feb. **1952.** 8 figs., map, beautifully illustrated. **DWB**—Mount McKinley is said to be the highest vertical uplift on earth, rising >20,000 ft above a plain. Southwesterly storms bring warmer weather at 18,000 ft where the author lived for 3 weeks in 1947. Average minimum temperature −25°F. Southwesters are preceded by cirrus streamers at 30,000 ft, increasing winds, temperature rising to zero or above, and seldom come suddenly or unexpectedly. Out of 89 days only 5 were CAVU (clear). Best (most stable and mild) weather is in July. April is clearest, but bitter NE and NW gales prevail then. CuNb anvils reach 20–25,000 ft in July. Sudden storms can occur at times when lenticular clouds form due to influence of mountains on air flow. Minimum temperature at Denali Pass (18,000 ft) during 4-year period (1947–1951) was −59°F. Hudson Stuck's reported −90°F minimum (1913–1932) at 14,600 ft is questionable. *Subject Headings:* **1. Mountain meteorology 2. Extreme minimum temperatures 3. Mountain storms 4. Mount McKinley, Alaska.**—*M.R.*

## BIOCLIMATOLOGY

*See also:* **Climate, environment, health,** 4.4–3; **Correlation and coincidence in meteorobiology and biometeorology** (de Rudder), 4.4–29; **Phenological observations in vegetation** (Szöke), 4.4–45; **Bioclimatic study of illumination** (Cena), 4.4–127; **Causation problem of meteorobiology** (Bortels), 4.4–140; **Light skin help foil A-bomb heat** (Buettner), 4.4–141; **Soil moisture measurement in raspberry plot** (Schrödter), 4.4–225; **Radiation in greenhouses** (Seemann), 4.4–247

4.4–252 551.586:551.524:612

Mills, Clarence A., **Temperature dominance over human life.** *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B*, 4(2):223–234, **1952.** 28 refs. English, German and French summaries p. 223–226. **DWB**—The physiology of heat production from food and disposal of waste heat is described and the importance of heat disposal in human growth, physical and mental energy, and health emphasized. Heat loss is related to air temperature; this is illustrated by observations of man and animals and by effects of temperature changes of past 10,000 years on history of civilization, including effects of temperature rise of past 100 years. *Subject Headings:* **1. Physiological climatology 2. Historical climates 3. Temperature changes.**—*C.E.P.B.*

4.4–253 551.586:61:551.506.1(43)

*Germany. Meteorologisches Amt für Nordwestdeutschland, **Medizin-meteorologische Ergänzungen.** [Medical meteorological supplement.] v. 1, No. 1. Sept. **1949.**—A regular feature of the "Zehntägiger Nordwestdeutscher Witterungsbericht für die Britische Zone." Contains current data on the air masses, condensation nuclei, temperatures of the free atmosphere, an interesting series of data, characterizing the stability of the air and the height of the ground layer, incoming radiation, sunspots and solar eruptions, ionospheric and geomagnetic characteristics, equivalent-temperature at the surface and cooling power. *Subject Headings:* **1. Medical meteorology 2. Observational data 3. Solar influences 4. Northwest Germany.**—*A.A.*

4.4–254 551.586:61:551.524

Webb, Paul (*Univ. of Washington, Seattle*), **The measurement of respiratory air temperature.** *Review of Scientific Instruments*, 23(5):232–234, May **1952.** 4 figs., 4 refs. **DLC**—To reduce error in measuring rapidly fluctuating air temperatures within a body cavity, a small, shielded thermo junction was devised. Experimental evaluation demonstrated that it read changing air temperatures to ±0.1°C with a 50 percent response time of 0.2 second at air flows exceeding 2 liters/minute. The technique of making the small junction and the recording apparatus are described. *Subject Headings:* **1. Temperature observation 2. Medical meteorology.**—*Author's abstract.*

4.4–255 551.586:612:551.585(494)

Loewy, Adolf (*Swiss Inst. for Mt. Climate and TB at Davos*), **Über Klimatophysiologie.** [On climatic physiology.] Leipzig, **1931.** 77 p. 13 figs., refs. **DLC**—A brief introduction to the study of the direct effect of climate as a whole and of its individual variables (temperature, humidity, radiation, pressure, wind) upon physiological functioning of human beings. The author discusses the concept of climate and the atmospheric and terrestrial climatic influences, climatic types and techniques for measuring cooling power (katathermometer and frigonimeter), temperature and water content of respired air (respiration psychrometer), water loss through perspiration and sweating, respiratory exchange, and body and skin temperatures. The physiological action of specific climates, namely, seashore climate, desert, humid tropical climates and high altitude climates, the special effect of high altitude climate upon the circulatory system and the action of solar radiation are considered. *Subject Headings:* **1. Physiological climatology 2. Climatic effects 3. Climatic types 4. Switzerland.**—*I.L.D.*

4.4–256 551.586:612

Reuter, Heinz, **Zur Berechnung kurzfristiger Änderungen der menschlichen Hauttemperatur.** [On the calculation of short-period changes of human skin temperature.] *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. B,* 4(2):213–222, **1952.** 2 figs., 7 refs., 33 eqs. German, English and French summaries p. 213–214. **DWB**—Formulas for heat radiation and conduction are applied to calculate short-period changes of skin temperature in the open, with a known coefficient of absorption $\nu$. A solution of the resulting differential equation is found, including effect of evaporation. A simplified form is $\frac{i}{f} - \frac{i(\nu+h)}{fvha\sqrt{\pi}} t^{-\frac{1}{2}}$ where $i$ is incoming radiation, $t$ = time. Constants from measurements by H. M. Bolz are: $f = 0.112$, $a_0 = 10^{-3}$ cm/sec, $h = f/k$ ($k$ = heat conductivity). *Subject Heading:* **1. Skin temperatures.**—*C.E.P.B.*

4.4–257 551.586:612(99)

Sauer, Waldemar, **Untersuchung der Abkühlungsgrösse in der Antarktika und ihre Bedeutung für das menschliche Leben in den Schnee- und Eisklimaten der Erde.** [Investigation of the cooling rate in the Antarctic and its importance for human life in the snow and ice climates of the earth.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte,* No. 38:271–273, **1952.** fig., ref. **DWB**—On the 3rd Byrd Expedition P. Siple constructed a frigorimeter from a water filled pyrolin cylinder and determined a "wind chill" formula $K_0/T = 797.1/t$ and a cooling power formula $K = (\sqrt{100v} + 10.45 - v)(33 - T)$, where $T$ is air temperature °C, $t$ is time of freezing and $v$ is wind speed in m/sec. Mean annual variation is calculated for 9 points in Antarctic. Frostbite occurs with cooling rate of 1300–1500 kcal/m²/h; at 2000 travel is dangerous. *Subject Headings:* **1. Cooling power 2. Frostbite 3. Antarctica.** —*C.E.P.B.*

4.4–258 551.586:612

Spangenberg, Wolf W., **Untersuchungen zur Entstehung der Schwüle.** [Investigations into the origin of sultriness.] *Angewandte Meteorologie,* 1(7):211–215, Oct. **1952.** fig., 4 tables, 4 refs. **MH-BH**—Temperature and relative humidity limits on occasions of "sultriness" are calculated for sun heights 0 to −15°, +1 to 45° and >50°, showing a rise of equivalent temperature with decreasing sun height. Change from shade to sun shows a similar effect. Degree of sultriness is also compared with cooling power, thunder, wind, etc. Author concludes that body condition is also an important factor. *Subject Heading:* **1. Sultriness.**—*C.E.P.B.*

4.4–259 551.586:612:551.547.3

Wagner, Heinrich, **Schwingungen im Verlauf der Körpertemperatur und ihre Kopplung mit föhnartigen Verhältnissen.** [Oscillations in the course of body temperature and their relation to föhn-like conditions.] *Angewandte Meteorologie,* 1(7):193–202, Oct. **1952.** 6 figs., tables, 12 refs. **MH-BH**—Observations of body temperature 3 times a day at tuberculosis hospitals in S.W. Saxony show considerable variations in numbers of rises and falls. These are discussed in relation to changes of isobaric topography 1000–96 mb; descending surfaces

are termed "föhn-like" and a composite föhn curve derived. This runs generally opposite to curve of mean body temperature, dangerous rises of temperature occurring with decreasing föhn. *Subject Headings:* **1. Body temperatures 2. Tuberculosis 3. Relative topography 4. Föhn effects.**—*C.E.P.B.*

4.4–260 551.586:612

Zimmermann, Gerhard, **Die Komponenten der Schwülehäufigkeit in Süddeutschland.** [The components of sultriness frequency in south Germany.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:278 281, **1952.** 2 figs., table, 9 refs. **DWB**—Taking the lower limit of sultriness as a vapor pressure of 14.1 mm Hg, numbers of sultry days are calculated for places in the U. S. Zone. A smooth curve of number of days against heights is drawn and a correction factor plotted, observed/expected, ranging from 0.36–2.43. *Subject Headings:* **1. Sultriness 2. Germany.**—*C.E.P.B.*

### MISCELLANEOUS INFLUENCES

*See also:* **Sun and sky radiation in sea and waters** (Lauscher), 4.4–129; **Local snowfall, Mannheim** (von Kienle), 4.4–210; **Water supply for arid soil** (Trombe), 4.4–226; **Terrain mapping of local climate, Bergstrasse, Heidelberg** (Kreutz and Schubach), 4.4–245

4.4–261 551.588.2

Baulig, Henri, **Le profil des versants en climat sub-aride, d'après T. J. D. Fair.** [Slope profile in a sub-arid climate, according to T. J. D. Fair.] *Annales de Géographie*, Paris, 61(323):46–49, Jan./Feb. **1952.** fig., 2 refs. **DWB**—The author reviews a paper by FAIR published in the *Geological Society of South Africa, Transactions*, 50:105–119, 1947. The typical slope profiles in a semiarid climate are shown, where 80–90% of the annual rainfall is concentrated in the summer and an intensive erosion is observed. Influence of slope and geological conditions on the climate are discussed. *Subject Headings:* **1. Topographic effects 2. Semiarid climates. I. Fair, T. J. D.**—*A.A.*

## MISCELLANEOUS APPLICATIONS

### SOLAR INFLUENCES

*See also:* **Rocket and meteor research** (Whipple), 4.4–88; **E layer ionization, measurement and correlation with solar eruption** (Bible), 4.4–98

4.4–262 551.590.21:523.74:621.396.029.1

Guha, U. C., **Reversal of polarization of microwaves from sun-spots.** *Indian Journal of Physics*, Calcutta, 25(1):8–16, Jan. **1951.** 3 figs., 5 refs., 6 eqs. **DLC**—The peculiar change in the relative intensities of the right-handed or left-handed polarization of sunspot-emitted microwaves is theoretically explained by calculating the transmission coefficient of a parabolic ion-barrier in a magnetic field (Zwaan-Kemble method). *Subject Headings:* **1. Microwave propagation 2. Sunspot effects 3. Polarization.**—*W.N.*

4.4–263 551.590.21:550.38:551.594.5(02)

Chapman, Sydney (*Prof. Natural Phil. Oxford Univ.*), **The earth's magnetism.** London, Methuen, **1951.** 2nd ed. rev. and reset. 127 p. 39 figs., 7 refs. **DLC**—A revision of the second edition of a work which first appeared in June 1936. The pocket sized book gives the overall picture of the present knowledge of the earth's magnetic field and its variations. Incidentally, the aurora, earth currents, solar relationships, cosmic rays and ionospheric disturbances in relation to the magnetic field are covered. The major parts are as follows: I. The main field and secular variation; II. Transient variations; III. Quiet-day solar daily variations ($S_q$); IV. Lunar daily variations ($L$); V. The morphology of the magnetic disturbance field D; and VI. Solar relations. Many charts, graphs and diagrams, but little mathematics are included. *Subject Headings:* **1. Terrestrial magnetism 2. Solar influences 3. Auroras 4. Textbooks.**—*M.R.*

## VISIBILITY

*See also:* **Vision through atmosphere** (Middleton), 4.4–11

4.4–264 551.591.361:551.593.11

**Anomale Sichtweite in der Dänemark-Strasse.** [Abnormal visibility in Denmark Strait.] *Wetterlotse*, 47:204–205, Nov. **1952. DWB**—Aug. 29, 1952 in 66°55′N, 24°55′W Cape Rink (820 m) was visible at distance of 130 sea miles, twice normal distance of visibility. Calm cold anticyclonic conditions. *Subject Headings:* **1. Exceptional visibility 2. Denmark Strait.**—*C.E.P.B.*

4.4–265 551.591.361:551.593.1:551.555.3

Rodewald, Martin, **Aussergewöhnliche Sichtweiten im Mittelmeer—trotz Staubfall.** [Unusual visibility in the Mediterranean, in spite of dust fall.] *Wetterlotse*, 45:168–174, Oct. **1952.** 2 figs. **MH-BH**—Night of June 14–15, 1952, off Algerian coast, visibilities up to 51 sea-miles, yet air was "full of fine yellow dust," associated with a sharp rise of temperature (24–30°C). Attributed to a föhn wind from Africa over calm, cold surface air over sea. This gave abnormal refraction. *Subject Headings:* **1. Exceptional visibility 2. Atmospheric refraction 3. Föhn effects 4. Dust falls 5. Mediterranean Sea.**—*C.E.P.B.*

## OPTICAL PHENOMENA

*See also:* **Abnormal visibility, Denmark Strait,** 4.4–264; **Unusual visibility in spite of dust fall, Mediterranean** (Rodewald), 4.4–265

4.4–266 551.593.1

**Abnormal refraction.** *Marine Observer*, 22(157):125–126, July **1952.** 2 photos. **DWB**—July 18, 1951, 36°24′N, 7°26′W one minute after sunset 5 circular images of the sun shot up into the sky at about 5 second intervals. Also reports of abnormal refraction in Bay of Fundy, Aug. 5, 1951, and off Cape St. Francis, 28 Aug. 1951 in mist (2 photos). *Subject Heading:* **1. Refraction phenomena.**—*C.E.P.B.*

4.4–267 551.593.1

*Freiesleben, H. C. and Prüfer, G., **Kimmtiefenbeobachtungen 1933–1938 und ihr Zusammenhang mit dem thermischen Aufbau der untersten Schichten der Atmosphäre über dem Wasser.** [Horizon dip observations 1933–38 and their connection with the thermal structure of the atmosphere over the water.] *Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Abhandlungen*, 2(10), **1952.** 137 p. 14 figs., 18 tables tabular appendix, 37 eqs. **DWB**—This is a summary of a larger MS work by the Deutsches ydrographisches Institut, Hamburg, based on about 2000 observations. Beginning with a definition of the geometric dip of the horizon, observations before 1931 are discussed. Then follows an account of the instruments, places and periods of observation, working up of data and comparison with KOHLSCHÜTTER's and other formulas. A new formula is developed taking account of all factors including water temperature and effective temperature, but this requires stationary conditions and very accurate temperature measurements at eye level and just above water surface. On the other hand, dip measurements are not only useful for navigation but give an idea of the thermal structure. The appendix sets out observations in detail. *Subject Heading:* **1. Tropospheric refraction.**—*C.E.P.B.*

4.4–268 551.593.54

Kraul, W. (*Sonnenobservatorium Wendelstein*), **Über die Blaufärbung der Sonne im September 1950.** [Blue color of the sun in September 1950.] *Zeitschrift für Meteorologie*, 6(8):253–255, Aug. **1952.** fig., table, 9 refs. **MH-BH**—R. WILSON of the Royal Observatory of Edinburgh reported measurement of blue sun made on Sept. 26, 1950 (*see item* 4.1–257, Jan. 1953, *MAB*). The author of this note reports similar measurements made at Hamburg and Wendelstein (Germany) which are in good agreement with results obtained by WILSON. The extinction phenomenon measured at Wendelstein is graphically represented. Other observations of the same phenomenon over Europe and Africa are mentioned. *Subject Heading:* **1. Blue sun.**—*G.T.*

## ELECTRICAL PHENOMENA

*See also:* **Atmospheric electricity** (Gish), 4.4–7 and (Tverskoĭ), 4.4–13; **Measurement of short-period variations of air ionization** (Schaffhauser), 4.4–61; **Ionosphere and weather** (Gherzi), 4.4–67; **Studies of sporadic E layer** (Banerji), 4.4–94; **E layer ionization . . .** (Bibl), 4.4 98; **Severe storm, July 6, 7, Friesland** (de Jong), 4.4–116; **Thunderstorms and sferics** (Holzer), 4.4–117; **Theory of thunderstorm** (Wichmann), 4.4–121; **Life of thundercloud** (Schüepp), 4.4–124; **Earth's magnetism** (Chapman), 4.4–263; **Thunder and lightning** (Jurwitz), 4.4–281

4.4–269 551.594.11:551.21:551.510.423

Hatakeyama, H. and Uchikawa, K., **On the disturbance of the atmospheric potential gradient caused by the eruption-smoke of the volcano Aso.** *Papers in Meteorology and Geophysics*, Tokyo, 2(1):85–89, March **1951.** 4 figs., 2 tables, refs. **DWB**—The potential gradient of the atmosphere, measured by an electrometer, became negative when the tip of the eruption smoke reached the zenith of the observing spot and it returned to positive when the ashes began to fall. An apparatus and experiment for studying the electrification of ashes by mutual collision are described. It was found that larger particles became positively charged and smaller particles negatively charged. *Subject Headings:* **1. Potential gradient 2. Volcanic dust 3. Smoke clouds.**—*I.L.D.*

4.4–270 551.594.11:551.594.222

Heigel, K., **Luftelektrisches Potentialgefälle und stille Entladungen.** [Atmospheric electric potential gradient and quiet discharges.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 38:408, **1952.** fig., refs. **DWB**—Hissing in radio occurs when antenna is charged in an electric field. Its occurrence during a thunderstorm at Bad Tölz on 16.4.1921 is compared with record of potential gradient. *Subject Headings:* **1. Potential gradient 2. Radio noise.**—*C.E.P.B.*

4.4–271 551.594.11:551.594.13(47)

Kulagin, D. I., **Sviaz' radiatsionnykh i elektricheskikh kharakteristik atmosfery v Tashkente.** [Relationship between radiational and electrical properties of the atmosphere at Tashkent.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofiz.*, 2:75–80, **1952.** 5 figs., 3 tables, 9 refs. **DLC**—The importance of the aerosol in regulating the radiational regime of the earth is pointed out. On the basis of a 20-year record of the annual variation in atmospheric turbidity, atmospheric potential gradient and atmospheric conductivity, and of daily variations of these atmospheric characteristics over a 5-year period, the conclusion is drawn that the atmospheric potential gradient varies inversely and atmospheric conductivity directly with the atmospheric turbidity. *Subject Headings:* **1. Potential gradient 2. Atmospheric conductivity 3. Turbidity 4. Radiation balance 5. Tashkent, U.S.S.R.**—*I.L.D.*

4.4–272 551.594.12

Agarwala, K. S., **The rate of atmospheric ionization and the air-earth current at Poona.** *Indian Journal of Meteorology and Geophysics*, 2(3):224–226, July **1951.** 2 figs., tables, 8 refs. **MH-BH**—Mean monthly values of the rate of ionization and the negative air-earth current at Poona are given, and their relationship is discussed. *Subject Headings:* **1. Ionization 2. Poona, India.**—*A.A.*

4.4–273 551.594.12

Hess, Victor F. and O'Donnell, George A., **On the rate of ion formation at ground level and at one meter above ground.** *Journal of Geophysical Research*, 56(4):557–562, Dec. **1951.** 3 tables, 8 refs. **DWB**—Measurements were made at heights of 3, 15 and 100 cm above ground. The total ionization at the ground and at the one meter level was found to be 11.5 I and 7.4 I, respectively. *Subject Headings:* **1. Ionization 2. Ion formation.**—*A.A.*

4.4–274 551.594.12:550.37

Hultqvist, Bengt (*Inst. of Radiophysics, Stockholm*), **Calculation of the ionization due to radioactive substances in the ground.** *Tellus*, 4(1):54–62, Feb. **1952.** 5 figs., 3 tables, 16

refs. **MH-BH**—In earlier calculations it seems to have not been considered that penetrating radiation from the ground can, independent of the density and composition of the ground, be expressed by the simple formula $I = C \times S$ where $S$ is the proportion of radioactive element in g/g and $C$ is a constant. Formulas for ionization when the ground is covered with an absorber of greater density than air, or when the radiation travels through air for long distances, are derived. The ionization from various minerals is calculated and found to agree in magnitude with measured values. Curves showing the decrease in ionization as a function of depth of snow cover are given for different values of snow density. The decrease in dose rate with altitude above the earth's surface (from 0 to 200 m) is shown graphically. *Subject Headings:* **1. Radioactivity of soil 2. Snow density 3. Ionization 4. Snow cover effects.**—*Author's abstract.*

## AURORAS

4.4–275 551.594.5(47)

**IArkoe poliarnoe siianie.** [A bright aurora borealis.] *Priroda*, Moscow, 41(7):117–118, July **1952. DLC**—Descriptions of a very bright aurora borealis observed in the U.S.S.R. on the evening of October 28, 1951, as reported by different observers in various parts of the U.S.S.R. *Subject Headings:* **1. Aurora borealis 2. U.S.S.R.**—*I.L.D.*

## RADIO METEOROLOGY

4.4–276 551.594.7

Abild, Bruno, **Überreichweiten bei ultrakurzen Wellen und ihre meteorologischen Ursachen.** [Abnormal ranges of ultrashort waves and their meteorological causes.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 35:227–228, **1952. MH-BH.** Also: *Germany, Nordwestdeutsche Rundfunkanstalten, Technische Hausmitteilungen*, 4:4–11, **1952. DWB**—Summary of the effect of meteorological conditions, especially vapor pressure gradient, in lowest 2 km on field strength of Hamburg ultra short wave transmitter at 150 km distance (100 km beyond optical horizon). *Subject Headings:* **1. Super-refraction 2. Ultrashort radio waves.**—*C.E.P.B.*

4.4–277 551.594.7:016

†Germany. Deutscher Wetterdienst in der US-Zone. Zentralamt Wetterdienstbibliothek, **Literatur-Ausstellung über Fragen auf dem Gebiet der Ausbreitung elektrischer Wellen vom Standpunkt der Meteorologie aus.** [Presentation of literature on problems in the field of electrical wave propagation from a meteorological point of view.] **[1951?]** 3 p. Mimeographed. **DWB**—Four brief bibliographies are included, covering the following subjects applicable to the general subject of electromagnetic propagation: 1) The influence of the atmosphere on electric waves (17 items); 2) Thunderstorms (13 items); 3) Temperature and humidity in the lower kilometer of the atmosphere (16 items); and 4) Pertinent German works on various fields of meteorology and forestry (10 items). *Subject Headings:* **1. Bibliographies 2. Electromagnetic waves 3. Germany.**—*M.R.*

4.4–278 551.594.7:551.521.1:538.3(02)

***†Hund, August, **Short-wave radiation phenomena.** New York, McGraw-Hill, **1952.** v. 1–2. 1st ed. 1332 p. 394 figs., 97 tables, 1009 eqs., bibliog. p. 1288–1301. **DLC**—This valuable work covers theoretical and experimental contributions from the discovery of the electromagnetic wave to their applications in radio communication and in guided missiles. In the two volumes, the nine chapters are broken down in sections under Subject Headings: Chapter (1) Fundamental concepts and relations of currents and electromagnetic fields, (2) Space electromagnetic fields of elementary electric and magnetic dipoles, (3) Fundamental methods used in electromagnetic theory, (4) Propagation characteristics (5) Transmission lines and radiation, (6) Unobstructed space radiation, (7) Space radiation in the presence of electromagnetic obstruction, (8) Electromagnetic diffraction and (9) Wave guides and cavities. Cross references are provided. The last three chapters are particularly of radio-meteorological interest. The appendix provides a list of the symbols used and an extensive bibliography. *Subject Headings:* **1. Short wave radiation 2. Electromagnetic waves 3. Radio meteorology.**—*W.N.*

4.4–279 551.594.7:551.51

Spencer, C. W., **Radio-wave propagation at 89 Mc./sec. in relation to synoptic conditions.** *Meteorological Magazine*, London, 81(961):206–212, July **1952.** fig., 4 tables, 5 refs. **DWB**—Superrefraction of 3.4 m waves over a distance of 257 km was recorded daily at Slough, England. It was compared with isobaric curvature; greatest relative frequency with cols, easterly and southerly types, least with cyclonic and northerly types. Nearly always with elevated (below 700 mb) or less often surface inversions, especially 950–900 mb. *Subject Headings:* **1. Superrefraction 2. Atmospheric disturbances.**—*C.E.P.B.*

4.4–280 551.594.9:551.515

Reiter, Reinhold, **Beziehungen zwischen Infra-langwellenstörungen und meteorologischen Erscheinungen bzw. Vorgängen.** [Relations between infra-long-wave disturbances and meteorological phenomena or processes.] *Meteorologische Rundschau*, 5(7/8):138–140, July/Aug. **1952.** 5 figs., 4 refs. **DWB**—Records of disturbances in 10–50 and 5–12 kHz within about 1000 km of Munich are tabulated 4 half-days before to 4 half-days after days of various meteorological events. Cold fronts and magnetic disturbances gave a maximum frequency, warm fronts and föhn a minimum. The annual variation of disturbances is discussed. *Subject Heading:* **1. Radio disturbances.**—*C.E.P.B.*

## ACOUSTICAL PHENOMENA

4.4–281 551.596.5:551.594.22(04)

Jurwitz, Louis R., **Thunder and lightning.** *Arizona Highways*, Phoenix, 27(6):4–9, June **1951.** 12 photos. **DWB**—A popular article on lightning and thunder including a few suggestions regarding rules to be followed during thunderstorms. Included are color photographs of clouds before and after a thunderstorm and of lightning with light reflected on clouds. *Subject Headings:* **1. Thunder 2. Lightning 3. Popular meteorology 4. Cloud photographs 5. Arizona. I. Austin, Hiram W.** (*illus.*).—*G.T.*

# PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON THE CLIMATE OF AUSTRALIA AND NEW ZEALAND

By: *Harris P. Kramer*

## EXPLANATORY NOTE

The area covered by this bibliography includes Australia, New Zealand, Tasmania and nearby islands, with a few studies on that general area of the Pacific.

This bibliography is selective, not exhaustive. For additional references we suggest that the reader consult those items containing bibliographies which are indicated by a dagger (†). Previously published items dealing with the subject, but not included here, are: 2.5–155 (Barnes), 2.5–198 (Wood), 2.6–107 (Dunbabin), 2.8–110, 2.9–58 (Leighton), 2.9–99 (Hogg), 2.11–104 (Angus), 2C–5 (Wild), 2G–25 (Davis), 2G–27 (Davis), 2H–196 (Smith), 2H–204 (Bowen), 2I–65, 3.3–81 (Vollprecht), 4.1–205 (Samuel), 4.1–252 (Martin), 4.4–80, 4.4–199 (Foley) and 4.4–234 (Hennely).

The usual arrangement of listing the items chronologically by years and the authors alphabetically within each year is followed.

An asterisk (*) indicates a good source of data and a symbol (§) the inclusion of synoptic charts.

The Outline of Contents provides the reader with a guide to the subject matter covered in the bibliography and the Geographical Outline serves to locate easily the articles containing data or climatic studies on specific locations within the area covered by the bibliography.

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# BIBLIOGRAPHY ON THE CLIMATE OF AUSTRALIA AND NEW ZEALAND

## 1861

**4D–1** 551.582.2(94)

*Todd, Charles, **Meteorology, 1860; including comparative observations, 1857–1860** (from the "Statistics of South Australia for 1860"). Adelaide, **1861.** 9 p. entirely tables. **DWB**—Meteorological observations at Adelaide, 1857–1860, are summarized in tables, giving values for barometer, wet and dry bulb temperature, "elastic force of vapor," humidity, solar and terrestrial radiation, cloud, rain, wind, etc. *Subject Headings:* **1. Climatic data 2. Adelaide, South Australia.**

## 1866

**4D–2** 551.582.2(94,931)

*Abbott, Francis, **Results of 25 years of meteorological observation for Hobart Town, together with a two years' register of the principal atmospheric meteors, and Aurora Australis . . . to which is added a meteorological summary for Adelaide, Melbourne, Sydney, Auckland.** Hobart Town, **1866.** 46 p. tables. **DWB** Climatic summaries of observations of usual elements kept from 1841–1854 at Hobart; 1858–1865 at Melbourne; 1860–1863 at Sydney; 1858–1863 at Adelaide. *Subject Headings:* **1. Climatic data 2. Hobart, Tasmania 3. Adelaide, South Australia 4. Melbourne, Victoria 5. Sydney, New South Wales 6. Auckland, New Zealand.**

## 1876

**4D–3** 551.506:551.543(94)

*Scott, Robert H., **Contributions to the meteorology of West Australia.** *Royal Meteorological Society, Quarterly Journal,* 3(19):177–178, July **1876.** entirely tables. **DLC**—Monthly and annual pressure (based on 4-daily observation) for Point King Lighthouse and (6-daily) for Breaksea Island Lighthouse for 1862–1868. *Subject Headings:* **1. Pressure data 2. King George's Sound, Western Australia.**—*M.L.R.*

## 1882

**4D–4** 551.506.1(94)

*Tebbutt, John, **Results of meteorological observations made at the private observatory of John Tebbutt, the Peninsula, Windsor, New South Wales, in the years 1877, 1878, 1879, 1880 and 1881.** Parramatta, N.S.W., **1882.** 20 p. tables. **NN**—Monthly summaries of the usual elements for that period. Earlier data were published for 1863–1866, 1867–1879, 1871–1876 (unchecked). *Subject Headings:* **1. Climatic data 2. Windsor, New South Wales.**

## 1890

**4D–5** 551.577.2(931)

*Meeson, John T., **The rainfall of New Zealand.** *New Zealand Institute, Wellington, Transactions,* 23:546–569, **1890.** map, tables. **NNA**—Summary of data up to that time, some dating back to 1866. Little long-term data available then. *Subject Headings:* **1. Precipitation data 2. New Zealand.**

## 1892

**4D–6** 551.506.1(94)

*Melbourne, Victoria Observatory, **Monthly record of results of observations in meteorology, terrestrial magnetism, etc. taken at the Melbourne Observatory, with abstracts from various localities in Victoria.** 1872-June **1892. DWB**—Climatic summaries in text, tables, charts, etc. (Cont'd. after June 1892 as its "Record of results of observations in terrestrial magnetism.") *Subject Headings:* **1. Climatic data 2. Melbourne, Victoria.**

## 1896

**4D–7** 551.515.7 551.582(94)

§Abercromby, Ralph (*ed.*), **Three essays on Australia.** Sydney, **1896.** 101 p. 4 plates, figs., tables. **NN**—Separate works by different authors as follows: 1) "Moving anticyclones in the Southern Hemisphere," by H. C. Russell (p. 1–15). (Reprint from *Royal Meteorological Society,*

*Quarterly Journal*, 19(85):23-34, 1893.) Progressive easterly motion of weather over Australia established. Twenty diagrs. of weather and anticyclone tracks are used to illustrate characteristics, influence on weather, progress, frequency by month, etc. of the anticyclones. 2) "An essay on southerly bursters," by HENRY A. HUNT (p. 16–62). The "burster" is traced through all its phases, its connection with anticyclones, pressure conditions, heat of the interior, etc. Historical sequence given, 1863–1894. 3) "Types of Australian weather," by HENRY A. HUNT (p. 63–101). Forty weather maps are used to illustrate types of Australian weather. *Subject Headings:* **1. Anticyclones 2. Tropical cyclones 3. Weather types 4. Australia. I. Russell, H. C. II. Hunt, Henry A.**

**4D–8** 551.582.2(94) 551.506.1(94)

*Queensland. Government Meteorologist, **Meteorological report, 1887–1891.** [Brisbane, 1889–1892.] Also: **Table of rainfall, 1889–1896.** [Brisbane, 1889–1896.] **DWB**–1) Standard climatic summaries in text and tables, instrumental records on graphs, charts, etc. 2) Precipitation data. *Subject Headings:* **1. Climatic data 2. Precipitation data 3. Queensland, Australia.**

1901

**4D–9** 551.525:551.584.42

Musson, C. T., **Soil temperature at Hawkesburg Agricultural College, Richmond, N.S.W.** *Agricultural Gazette of N.S. Wales, Miscellaneous Publication*, Sydney, No. 479, June **1901.** 12 p. figs., tables. Abstracted from reprint. **DLC**—Observations made at ½ in., 6, 12 and 24 in. below surface the first week of each month, May 1898–April 1899. Monthly variations of soil temperature, effect of rainfall and heat requirements of plants analyzed. (*Same item as* 2C–186, March 1951, *MAB.*) *Subject Headings:* **1. Soil temperatures 2. Richmond, New South Wales.** –*N.T.Z.*

1903

**4D–10** 551.582.2(931)

*Royal Society of New Zealand, **Transactions and Proceedings.** v. 1–35, 1868–**1903.** Prior to 1933 the Society was known as the New Zealand Institute. **DLC**—First 13 vols. (1868–1880) give in appendix monthly temperature, rainfall, pressure, wind force and direction, and rain days for the chief towns of New Zealand together with brief monthly notes. Vols. 14–35 (1881–1903) include comparative abstracts (yearly means and long period means) together with brief monthly notes. Vol. 22 (1889) provides a rainfall table for 1866–1889. *Subject Headings:* **1. Precipitation data 2. Climatic data 3. New Zealand.**

1904

**4D–11** 551.506.1(94)

*New South Wales. [Government Astronomer], **Results of meteorological observations made in New South Wales. 1870–1873; 1876–1902.** (Under direction of H. C. Russell.) Sydney, **1871–1904. DWB**—Observational data, charts, etc. for New South Wales. *Subject Headings:* **1. Observational data 2. New South Wales. I. Russell, H. C.**

1906

**4D–12** 551.588.2

Taylor, T. Griffith, **Correlation of contour, climate and coal; a contribution to the physiography of New South Wales.** *Linnean Society of New South Wales, Sydney, Proceedings*, 31:517–529, **1906.** 3 figs., 4 plates. **NNA**—Author points out how in the Hunter River District, a large extent of coal supply is counter-balanced by below average rainfall for the latitude; he states that the relatively low rainfall is indirectly due to the presence of the Permo-Carboniferous coal measures. He concludes that the geologic formation Cassilis Geocol exercises profound influence on climatic conditions of the state, and that correlation therefore exists between contour, stratigraphy and climate. Plates show isolines for temperature and rainfall superimposed on topographic maps. *Subject Headings:* **1. Topographic effects 2. Climate of New South Wales 3. Physiography 4. Hunter River District, New South Wales.**

1909

**4D–13** 551.577.2(94)

*Australia. Meteorological Branch, **Monthly distribution of Australian rainfall.** *Australia. Meteorological Branch, Bulletin*, No. 4, **1909.** 10 p. graphs, tables. **DWB, NNA**—General seasonal distribution of rainfall throughout Australia is indicated in discussion, maps and tables. *Subject Headings:* **1. Precipitation distribution 2. Australia. I. Hunt, Henry A.**

**4D–14** 551.577.37 551.579.4

*§Australia. Meteorological Branch, **The remarkable flood rains over southeastern Australia during the winter of 1909.** *Australia. Meteorological Branch, Bulletin*, No. 3, **1909.** 26 p. maps,

diagrs., tables. **DWB, NNA**—The winter meteorological conditions and the antecedent general weather over the Commonwealth during 1909 are reviewed, along with an account of the heavy storms and flood rains in southeastern Australia in Aug. 1909. Explanatory graphs and synoptic charts are included. Tables give some temperature, rainfall, river level and flood data for extended periods and for 1909. *Subject Headings:* **1. Precipitation extremes 2. Floods 3. Water level variations 4. Southeastern Australia.**

**4D–15** 551.582(94)

*Lockyer, W. J. S., **A discussion of Australian meteorology.** London, **1909.** 117 p. 11 figs., 10 plates, 10+tables, refs. **NN**—Study of pressure, rainfall and river variations, seasonal and year to year, and comparison of air movement over Australia with that of South Africa and South America with illustrative diagrs., graphs, tables and refs. *Subject Headings:* **1. Climate of Australia 2. Atmospheric circulation 3. Australia 4. Southern Hemisphere.**

## 1910

**4D–16** 551.506.1(94)

*Adelaide, South Australia. Observatory, **Meteorological observations 1876–1907.** Adelaide, 1878–**1910.** tables. **NN, DWB**—Thrice daily observations of the usual elements at the Adelaide Observatory as well as means, maximum and minimum values and abstracts of results are given. Some climatic means for several "out stations" also included. *Subject Headings:* **1. Climatic data 2. Observational data 3. Adelaide, South Australia 4. South Australia.**

**4D–17** 551.582(94)

*Hunt, Henry A., **On the climate of the Yass-Canberra district.** *Australia. Meteorological Branch, Bulletin*, No. 7, **1910.** 6 p. fold., map, tables. **NNA**—Climatic conditions in the region of the "proposed capital site" of Canberra are reviewed, using rainfall and other climatic data from several stations for varying periods. Large detailed map of southeastern New South Wales shows rainfall and temperature conditions in the immediate area. *Subject Headings:* **1. Climate of Canberra 2. Canberra, Australia.**

**4D–18** 551.509.33:551.577

§Quayle, E. T., **On the possibility of forecasting the approximate winter rainfall for northern Victoria.** *Australia. Meteorological Branch, Bulletin*, No. 5, **1910.** 7 p. diagr., charts, 3 tables. **NNA**—Author postulates a possible system for forecasting winter rain based on number of monsoonal disturbances (primarily) and on mean pressure and temperature for the preceding summer. Calculations are made, and following winter rains found to be in reasonably good accordance as seen in the records for 1888–1910. Some isobaric representations of typical monsoonal depressions are included. *Subject Headings:* **1. Long range forecasting 2. Precipitation forecasting 3. Victoria.**

**4D–19** 551.506.3 551.582.2(94)

*§Western Australia. Government Astronomer, **Meteorological report for the years 1876–1884.** Perth, 1887–**1885.** Also: **The climate of Western Australia from meteorological observations made during the years 1876 1899.** Perth, **1901.** 128 p. And: **Meteorological observations made at the Perth Observatory and other places in Western Australia. 1897–1907.** Perth, 1899–**1910.** tables, graphs, maps. **DWB**—1) Graphs of daily wind speed and direction, temperature, pressure, etc. for selected stations. 2) Summary of weather and climate with tables, weather maps, schematic charts, etc. *Subject Headings:* **1. Climatic data 2. Observational data 3. Perth, Western Australia 4. Western Australia.**

## 1913

**4D–20** 551.506.1(94)

*Australia. Meteorological Branch, **Australian Monthly Weather Report and Meteorological Abstract.** 4 v. Jan. 1910–Sept. **1913.** numerous tables. **DWB**—Annual volume of meteorological statistics, complete rainfall and other observational data, climatic data from selected stations, etc. and various articles on Australian climate and meteorology. *Subject Headings:* **1. Observational data 2. Australia.**

**4D–21** 551.515.8 551.515.7(94)

Devereux, Humphrey P., **The Australian highs and the secondary anticyclonic systems.** *Royal Meteorological Society, Quarterly Journal*, 39:65–68, **1913.** **DWB**—Some meteorological observations, 1871–1884, are examined as possible evidence of cyclical movements of the Australian High and its secondary anticyclones in the neighborhood of New Zealand. *Subject Headings:* **1. Air masses 2. Anticyclones 3. Australia HIGH 4. New Zealand.**

**4D–22** 551.582(94)

*§Hunt, Henry A.; Taylor, T. Griffith and Quayle, E. T., **The climate and weather of Australia.** Melbourne, Meteorological Bureau, **1913.** 93 p. 159 figs., tables. **NNA**—Thorough survey of Australian climate and meteorology which includes size of continent, climatic variations, temperature, pressure, winds, rainfall distribution, humidity and wet bulb temperatures, ocean currents and topography, drought, flood rains, hurricanes and "bursters," forecasting, etc. Four climatic regions are delineated. Representative synoptic charts and data are included. This is one of several general summary papers on Australian climate by HUNT. Others appear under similar titles as *Australia. Meteorological Branch, Bulletin*, No. 1, 1908 (rev. ed. in 1911 and 1920), and No. 9, 1914. Similar summaries (by various authors) appear in *Australia. Official Yearbook* (*see* 4D–271 below), for each year, and in the "Federal Handbook of Australia," in several years. *Subject Headings:* **1. Climate of Australia 2. Australia.**

**4D–23** 551.586:63

Taylor, T. Griffith, **Climatic control of Australian production.** *Australia. Meteorological Branch, Bulletin*, No. 11, **1913.** 32 p. 43 figs., tables. **DWB, NNA**—Author attempts to correlate the factor of climate in each state of Australia with production of cattle, sheep and wheat, using data for 1912 which is considered an average year. A note on world wheat production and Australia's part in it, is included. Product distribution and climatic charts and brief data given. *Subject Headings:* **1. Agricultural climatology 2. Australia.**

## 1915

**4D–24** 551.578.11

Anderson, V. G., **Influence of weather conditions on the amounts of nitric acid in the rainfall near Melbourne, Australia.** *Monthly Weather Review*, 43:345–346, July **1915.** tables. **DWB, NN**—Results of daily observations of nitrogen acids in rainfall, 1912–1914, near Melbourne are briefly reported. Relations are seen between general weather conditions and amount of nitrogen acids found. *Subject Headings:* **1. Rainfall composition 2. Nitric acid 3. Melbourne, Victoria.**

**4D–25** 551.576.5:551.515(94)

§Quayle, E. T., **Relation between cirrus directions as observed in Melbourne and the approach of the various storm systems affecting Victoria.** *Australia. Meteorological Branch, Bulletin*, No. 10, **1915.** 17 p. charts, tables. **DWB, NNA**—Author discusses his extended observations of cloud movements over Melbourne for the purpose of showing relations between cirrus movements and the approach of various types of storm systems affecting Victoria. He includes representative synoptic charts, schematic diagrams and data. *Subject Headings:* **1. Cloud movement 2. Cirrus clouds 3. Weather forecasting 4. Melbourne, Victoria.**

## 1916

**4D–26** 551.586:599

Taylor, T. Griffith, **The control of settlement by humidity and temperature (with special reference to Australia and the Empire); an introduction to comparative climatology, illustrated by 70 climographs.** *Australia. Meteorological Branch, Bulletin*, No. 14, **1916.** 32 p. 21 figs., refs. **DWB, NNA**—Author discusses humidity and temperature in relation to development of the white race and the difficulties of settlement in the tropics, with special reference to Northern Australia. However, the numerous climographs show how climates of all British colonies compare with those of the parent state. *Subject Headings:* **1. Climatology 2. Human activity 3. Tropical Australia 4. British Empire.**

**4D–27** 551.587(94)

§Taylor, T. Griffith, **Initial investigations in the upper air of Australia.** *Australia. Meteorological Branch, Bulletin*, No. 13, **1916.** 16 p. 34 figs., tables. **DWB, NNA**—First results of upper air investigation by balloon sondes, 1913–1914, are reported. Only 13 balloons were recovered, however. Some meteorographs and theodolite tracks are given and some brief data. *Subject Headings:* **1. Upper air soundings 2. Upper air climatology 3. Australia.**

## 1917

**4D–28** 551.586:63

Rosenkranz, Johanne, **Beziehungen zwischen den Schwankungen des Klimas und der Produktion in Australien.** [Relations between climatic variations and production in Australia.] Hamburg, **1917.** 50 p. 3 figs., 18 tables. refs. **NNA**—Effects of Australian climate on wheat, rabbit and wool production are discussed using scattered statistics from about 1880 to 1913. *Subject Headings:* **1. Agricultural climatology 2. Australia.**

## 1918

4D–29 551.582:551.577(94)

*§Taylor, T. Griffith, **The Australian environment (especially as controlled by rainfall); a regional study of the topography, drainage, vegetation and settlement; and of the character and origin of the rains.** *Australia. Advisory Council of Science and Industry, Memoir*, No. 1, **1918.** 188 p. 183 figs., 74 tables, 125 refs. Reprinted in Taylor's **Australia. 1940.** 15 color maps. Also reprinted separately as "**Atlas.**" **NNA**—Detailed study made of interrelationships of rainfall, topography and vegetation in 15 regions of Australia and its association with various storm systems. Author has prepared a solar-control model showing the relation between the sun's change in declination, the position of the anticyclone belt, the permanent winds and the monthly rainfall throughout Australia. Contents include discussion of this model, of the march of the rain belt, of rainfall charts illustrating reliability, wet seasons and uniformity, of vegetation conditions, and climographs which are used to correlate the various types of climate found in Australia with those of other parts of the world and hence to deduce settlement probability, crops, etc. Detailed study of physiography of the whole continent with contour maps included. Bibliography not significantly climatological. *Subject Headings:* **1. Climate of Australia 2. Precipitation effects 3. Australia.**

## 1919

4D–30 551.577:551.590

Quayle, E. T., **Tropical control of Australian rainfall; the influence of tropical conditions upon the development and rainfall production of storms in the temperate belt, and the increased range and accuracy of Australian rain forecasts made possible by taking this into account.** *Australia. Meteorological Branch, Bulletin*, No. 15 [1919?]. 24 p. charts, diagrs., tables. **NNA**—Periods of high minimum temperature in northern Australia and New Guinea are associated with or closely followed by heavy rain farther south. This leads to the possibility of general rainfall forecasts for 2–3 weeks. (*Same item as* 2A–42, Jan. 1951, *M.A.B.*) *Subject Headings:* **1. Precipitation forecasting 2. Extended forecasting 3. Australia 4. New Guinea.**—*C.E.P.B.*

## 1920

4D–31 551.586:63

Taylor, T. Griffith, **Agricultural climatology of Australia.** *Royal Meteorological Society, Quarterly Journal*, 46:331–356, **1920.** 9 figs., tables, 7 refs. **DWB**—Good summary of climatic and agricultural conditions in general and for particular regions in Australia. *Subject Headings:* **1. Agricultural climatology 2. Australia.**

4D–32 551.582(02)(94)

Taylor, T. Griffith, **Australian meteorology; a text-book including sections on aviation and climatology.** Oxford, **1920.** 312 p. 229 figs., table, refs. **NNA**—Text on the principles of meteorology with particular emphasis on their application to Australia. Chapters discuss the usual elements, weather charts, air masses and their origins, features, etc., thunderstorms, tornadoes and hurricanes, forecasting, weather cycles, applications to aviation and climatology. Appendices deal with topographic control of rainfall and temperature and rainfall averages for several Australian towns. Work is well illustrated and indexed, with references in footnotes. *Subject Headings:* **1. Climate of Australia 2. Aeronautical climatology 3. Textbooks 4. Australia.**

## 1921

4D–33 551.588.7

Quayle, E. T., **Possibility of modifying climate by human agency with special application to southeastern Australia.** *Royal Society of Victoria, Proceedings, New Ser.*, 33:115–132, **1921.** map, tables. **NNA**—Possibilities of damming to produce lakes, and consequent irrigation systems in New South Wales and northern Victoria are considered plausible for ameliorating climate and increasing rainfall. *Subject Headings:* **1. Climatic amelioration 2. New South Wales 3. Victoria.**

## 1923

4D–34 551.583

Howchin, Walter, **The recent extinction of certain marine animals of the southern coast of Australia together with other facts that are suggestive of a change in climate.** *Australasian Association for the Advancement of Science, Sydney, Report*, 16:94–101, **1923.** refs. **NNA**—Evidence and theories cited. *Subject Headings:* **1. Climatic changes 2. Australia. I. Cainozoic and Quaternary Climate of Australasia Committee.**

1924

**4D–35** 551.582(94)

Kidson, Edward, **Observations from the Willis Island meteorological station.** *Australasian Association for the Advancement of Science, Report,* 17:155–170, **1924.** 4 figs., 2 tables. **NNA**—Notes and diagrams for the usual elements and pilot balloon data up to 6000 m for varying observational periods, 1922–1924, for this small island 250 miles east of Port Douglas in the Coral Sea are given. *Subject Headings:* **1. Climatology 2. Upper air winds 3. Willis Island, Coral Sea.**

1925

**4D–36** 551.524.33(931)

*Arctowski, Henryk and Zych, Stanisław, **O wahaniach temperatury na Nowej Zolandji w latach 1910–1919.** [On temperature variations observed in New Zealand during the years 1910–1919.] *Kosmos,* Lwów, 50(2/3):490–529, **1925.** 28 figs. 17 tables appended. In Polish, French summary p. 509–511. **NNA**—Using British Meteorological Office data for N. Z. and nearby islands for 1910–1919, monthly and annual temperature variations are studied and compared with those of the Philippines and other parts of the world. *Subject Headings:* **1. Temperature variations 2. New Zealand.**

**4D–37** 551.583 551.591 551.510.42

*Kidson, Edward, **1. Some periods of Australian weather. 2. Observations of visibility at various Australian stations during 1923 and 1924. 3. Atmospheric pollution: observations with the Owens' dust-counter during 1923 and 1924.** *Australia. Meteorological Branch, Bulletin,* No. 17, **1925. DWB, NNA**—In Pt. 1 (p. 1–34, 13 figs., 5 tables, 11 refs.) cycles in Australian weather since 1890 are studied pointing out the three year pressure periods. Pt. 2 (p. 34–46, 10 tables) gives visibility data and discussion for several stations. Pt. 3 (p. 47–50, table) gives table of atmospheric pollution observations at Melbourne, April 1923–Dec. 1924, with some discussion. *Subject Headings:* **1. Periodicities 2. Visibility 3. Atmospheric pollution 4. Melbourne, Victoria 5. Australia.**

**4D–38** 551.515.2(94)

*Visher, S. S. and Hodge, D., **Australian hurricanes and related storms with an appendix on hurricanes in the South Pacific.** *Australia. Meteorological Branch, Bulletin,* No. 16, **1925.** 54 p. charts, tables. **DWB, NNA**—Includes all recorded data up to 1925 regarding occurrence of hurricanes in Australia and adjacent ocean areas. The practical human and economic side of the phenomena are included to some degree as well as the data and theory. *Subject Headings:* **1. Hurricane frequencies 2. Australia 3. South Pacific.**

1927

**4D–39** 551.515.3(94)

Hunt, Henry Ambrose and Humphreys, W. J., **Australian vs. American tornado frequency.** *American Meteorological Society, Bulletin,* 8:128–129, Sept. **1927. DWB**—Two letters discussing Australian and American tornado frequency. (*Same item as* E–225, May 1950, *MAB.*) *Subject Headings:* **1. Tornado frequencies 2. Australia 3. United States.**

**4D–40** 551.524.37:634

Kidson, Edward, **Protection of orchards against frost.** *New Zealand Journal of Science and Technology,* Wellington, 9(4):213–225, Nov. **1927.** 2 figs., 2 tables. **NN**—Problems of frost protection for fruits in central Otago are discussed. Weather conditions and synoptic situations favorable to frost and problems of frost forecasting are noted, followed by discussion of protective measures. *Subject Headings:* **1. Frost protection 2. Frost forecasting 3. Otago, New Zealand.**

1928

**4D–41** 551.577.21(94):551.586:62

Barkley, Henry, **Climatic control of wool production.** *Australian Wool Annual,* 1:68–79, **1927/1928.** 4 figs. **DA, NNA**—Factors considered are optimum rainfall for sheep in Australia, rainfall and weight and quality of wool, reliability of rainfall in grazing areas and rainfall forecasting possibilities. Direct relation is seen between amount of rainfall and the wool produced per sheep. *Subject Headings:* **1. Agricultural climatology 2. Precipitation 3. Wool production 4. Australia.**

**4D–42** 551.513 551.576

*Kidson, Edward, **Cloud-heights from Melbourne Observatory photographs.** *Australasian Association for the Advancement of Science, Report,* 16:153–192, **1923.** 5 figs., 4 tables, 9 refs. **NNA.** Also: **The circulation of the atmosphere above Melbourne.** *Royal Meteorological Society, Quarterly*

*Journal*, 54:27 42, **1928.** 4 figs., 4 refs. **DWB**—In the first article results of 430 pairs of cloud photographs at Melbourne, 1897–1901, are analyzed and discussed and results tabulated at length. The second article discusses a long series of nephoscope observations of high cloud made at Melbourne. Estimates of upper wind velocities and deductions as to general circulation are made. *Subject Headings:* **1. Cloud observations 2. Atmospheric circulation 3. Upper air winds 4. Melbourne, Victoria.**

**4D–43** 551.582(94,99)

Taylor, T. Griffith, **Climatic relations between Antarctica and Australia.** *American Geographical Society, Special Publication*, No. 7, **1928.** p. 285–299. 12 figs., 9 refs. **NNA**—Climatic conditions of and relations and correlations between the two continents are investigated, including consideration of air movements and circulation, precipitation, fronts, solar energy, etc. *Subject Headings:* **1. Climatology 2. Australia 3. Antarctica.**

1929

**4D–44** 551.509.33:551.577.33

Hunt, Henry A., **A basis for seasonal forecasting in Australia.** *Royal Meteorological Society, Quarterly Journal*, 55:323–329, Oct. **1929.** figs., tables. Discussion p. 330–334. **DWB**—Points out evidence of weather cycles of about 4 years in Australia depending upon relations between temperature, rainfall and vegetation; causes sought. (*Same item as* 2B–83, Feb. 1951, *MAB.*) *Subject Headings:* **1. Long range forecasting 2. Periodicities 3. Australia.**—*C.E.P.B.*

**4D–45** 551.509:633.11

Kidson, Edward, **Weather and wheat yield at Lincoln College.** *New Zealand Journal of Science and Technology*, Wellington, 11:141–148, Oct. **1929. DLC**—Tentative conclusions for crop forecasting. *Subject Headings:* **1. Crop yield forecasting 2. Wheat yield 3. Agricultural meteorology 4. Lincoln College, New Zealand.**

**4D–46** 551.510.42

§Marshall, P. and Kidson, Edward, **The dust-storm of October 1928.** *New Zealand Journal of Science and Technology*, Wellington, 10(5):291–299, Feb. **1929.** 3 figs. **DLC, NNA**—Chemical content of dust and its Australian origin noted in Pt. 1; Pt. 2 discusses accompanying synoptic conditions. *Subject Headings:* **1. Dust storms 2. New Zealand.**

**4D–47** 551.509.33:551.577

Quayle, E. T, **Long range rainfall forecasting from tropical (Darwin) air pressures.** *Royal Society of Victoria, Melbourne, Proceedings*, New Ser., 41:160 164, **1929.** 2 figs. **DWB**—Darwin, North Australia, air pressures June–July have a correlation of −.81 with rainfall over northern Victoria in Aug.–Sept. Forecasts based on this would have been correct on 82% of the occasions. (*Same item as* 2B–85, Feb. 1951, *MAB.*) *Subject Headings:* **1. Long range forecasting 2. Atmospheric pressure correlations 3. Australia.**—*C.E.P.B.*

**4D–48** 551.513

Vogel, Hans, **Die atmosphärische Zirkulation über Australien.** [Atmospheric circulation over Australia.] *Geographische Gesellschaft in München, Mitteilungen*, 22(2):181–237, **1929.** 19 plates, 41 refs. **NNA.** Review by Robert DeC. Ward in: *Geographical Review*, 21:344, **1931. DLC**—"Intensive schematic study made of the characteristics and habits of the cyclones and anticyclones" of the Australia region, and "results of the schematic treatment applied to varying conditions of atmospheric circulation over Australia throughout the year." The four parts take up: essential facts of atmospheric circulation in the subtropical high pressure belt of the Southern Hemisphere, circulation over Australia in the course of a year, individual examples of weather types and monsoons of northern Australia. Tracks of cyclones and anticyclones are plotted for individual months; behavior and relations of high and low pressure areas are analyzed. Type-weather-map situations are shown in a series of small sketch maps. *Subject Headings:* **1. Atmospheric circulation 2. Air masses 3. Monsoons 4. Australia 5. Southern Hemisphere. I. Ward, Robert DeC.**

**4D–49** 551.524.33 551.543.3

*Zych, Stanisław, **Wahania temperatury na obszarze Pacyfiku i w Australiji w latach 1910–1919.** [Variations of temperature in the Pacific and in Australia during the years 1910–1919.] *Kosmos, Ser. A*, Lwów, 54(1/2):533–583, **1929.** 26 figs., 20 tables, refs. In Polish, French summary p. 558–562. **NNA**—Using observations from 20 stations of Australia for 1910–1919, author analyzes cyclical trends of temperature and pressure in the Pacific area and in Australia. *Subject Headings:* **1. Temperature variations 2. Pressure variations 3. Periodicities 4. Australia 5. Western Pacific Ocean.**

## 1930

**4D–50** 551.577.2(931)

Kidson, Edward, **Average annual rainfall in New Zealand for the period 1891 to 1925.** Wellington, New Zealand, Dept. of Scientific and Industrial Research, Meteorological Branch, **1930.** 7 p.+5 maps. **DWB**—The maps show the stations, topography, average number of rain days per annum and mean annual rainfall, 1891–1925, for North and South Islands, accompanied by introductory text on procedures, stations, topography and summaries of conditions on the two islands. *Subject Headings:* **1. Precipitation 2. Precipitation charts 3. New Zealand.**

**4D–51** 551.552(931)

Thomson, Andrew, **Surface winds at Waitatapia, Bulls.** *New Zealand Journal of Science and Technology*, Wellington, 11(6):411–415, April **1930.** 4 figs., 3 tables. **NNA**—Frequencies of velocity and direction of wind at Bulls (which is considered representative of the Wanganui-Wairarapa area) are calculated using 10 years observations; some of the typical accompanying pressure conditions are noted. *Subject Headings:* **1. Winds 2. Atmospheric pressure 3. Bulls, New Zealand.**

## 1931

**4D–52** 551.543(931)

Kidson, Edward, **The annual variation of pressure in New Zealand.** *New Zealand Journal of Science and Technology*, Wellington, 13(1):39–44, Aug. **1931. DLC**—Pressure records from 7 New Zealand stations are analyzed. *Subject Headings:* **1. Annual pressure variations 2. New Zealand.**

**4D–53** 551.513

Kidson, Edward, **Notes on the general circulation in the New Zealand region.** *Beiträge zur Geophysik*, 34:1–8, **1931.** 4 figs., 6 refs. **DWB, NNA**—Brief discussion of the general circulation of the Southern Hemisphere and complexities of New Zealand weather and climate occurring when this circulation is modified by local topography. *Subject Headings:* **1. Atmospheric circulation 2. New Zealand 3. Southern Hemisphere.**

**4D–54** 551.515.4(931)

*Kidson, Edward and Thomson, Andrew, **The occurrence of thunderstorms in New Zealand.** *New Zealand Journal of Science and Technology*, Wellington, 12:193–206, **1931.** 6 figs., 5 tables. 2 refs. **DLC**—States that accurate records of thunderstorms in N. Z. are scanty, but as much data as possible since 1905 is collected and analyzed. Frequency, distribution, annual and diurnal variations are charted. (*Same item as* H–35, Aug. 1950, *MAB.*) *Subject Headings:* **1. Thunderstorms 2. New Zealand.**

**4D–55** 551.582:631.48(94)

Prescott, J. A., **The soils of Australia in relation to vegetation and climate.** *Australia. Council for Scientific and Industrial Research, Bulletin*, No. 52, **1931.** 82 p. 17 figs., 10 plates, 2 fold. maps, 16 tables, refs. **NN**—Primarily a study of soil; climatic factors considered on p. 32–45, including the leaching factor, capillary movements of soil water, temperature effects, wind conditions and nitrogen content of soil in relation to climate. Besides climate, factors dealt with are those controlling mobility of soil constituents, laterite, principal vegetation and major soil groups of Australia. Some climatic graphs and charts are included but no significant data. *Subject Headings:* **1. Soil climatology 2. Soil types 3. Vegetation 4. Australia.**

## 1932

**4D–56** 551.524.37 551.578.4 551.578.7

Kidson, Edward, **The frequency of frost, snow and hail in New Zealand.** *New Zealand Journal of Science and Technology*, Wellington, 14(1):42–54, Aug. **1932.** 8 figs., refs. **NNA**—Geographical distribution due mainly to topography and location, and monthly frequencies of frost, discussed and shown on schematic charts. Number of days 1 year with minimum temperatures below freezing, number of days of snow and hail per annum and annual distribution of hailstorms and snowfall are discussed and charted. (*Same item as* 4C–165, March 1953, *MAB.*) *Subject Headings:* **1. Frost 2. Hail 3. Snow 4. New Zealand.**

**4D–57** 551.524

Kidson, Edward, **Mean temperatures in New Zealand.** *New Zealand Journal of Science and Technology*, Wellington, 13(3):140–153, Dec. **1931.** Also: Kidson, Edward and Crust, A. G. C., **The diurnal variation of temperature at Wellington.** *Ibid.*, 13(5):278–283, April **1932. DLC**—The first item presents annual and monthly isotherms for New Zealand using observations for 1860–

1930. In the second, calculations are based on hourly temperature values observed at Wellington, 1928–1931. *Subject Headings:* **1. Temperature variations 2. Wellington, New Zealand 3. New Zealand. I. Crust, A. G. C.**

**4D–58** 551.515.8(94)

§Lammert, Luise, **Frontologische Untersuchungen in Australien.** [Frontological investigations in Australia.] *Beiträge zur Physik der freien Atmosphäre*, 19:203–219, **1932.** 14 figs., 21 refs. **DLC, NN.** Translation in: *U. S. Air Weather Service, Translations and Reprints Series*, **1943.** 20 p. **DWB**—Air mass and frontal characteristics of Australia throughout the year and attending meteorological conditions are discussed as representative of the Southern Hemisphere. Typical synoptic charts and some temperature graphs are included. *Subject Headings:* **1. Air masses 2. Fronts 3. Synoptic studies 4. Australia. I. U. S. Air Weather Service.**

**4D–59** 551.594.6

Munro, G. H. and Huxley, L. G. H., **Atmospherics in Australia. I.** *Australia. Council for Scientific and Industrial Research, Bulletin*, No. 68, **1932.** 50 p. 13 figs., 2 tables, refs. Also: *Australia. Radio Research Board, Report*, No. 5, **1932. DWB**—Paper describes progress of investigation of atmospherics which interfere with radio reception in Australia. Cathode-ray direction-finders used are described. Regular observations of directions and intensities of individual atmospherics, taken at two stations 300 mi apart and their origins, located at distances up to 1500 mi from stations. Diurnal and seasonal variations in the activity of atmospherics for over a year are described. *Subject Headings:* **1. Sferics 2. Radio reception 3. Australia.**

**4D–60** 551.582(94)

*Taylor, T. Griffith, **Climatology of Australia.** (In: **Köppen-Geiger Handbuch der Klimatologie.** v. 4, Pt. S, **1932.** p. 1–108. 37 figs., 20 tables, 46 refs.) Also: Kidson, Edward, **Climatology of New Zealand.** (*Ibid.*, p. 111–137. 5 figs., 20 tables, 6 refs.) **NNA**—I. Thorough survey of Australian climate is made. Pt. 1 takes up the general climatology of the continent, including historical introduction, factor of latitude, topography, highlands, homoclimes, hythergraphs, ocean currents, and each of the usual elements in some detail with schematic charts and small tables. More extensive tables are appended. Pt. 2 discusses regional climates of Australia, the moderately humid croplands, the dry pastoral lands, the arid pastoral lands and climate of New Guinea. Pt. 3 (in German by W. Köppen) discusses the climatic regions according to his classification system. Pt. 4, p. 79–107, consists of tables of climatic data. II. Kidson gives a general climatic summary of weather and climate of New Zealand accompanied by temperature and precipitation charts and tabulated climatic summaries for about 28 stations. *Subject Headings:* **1. Climate of Australia 2. Climate of New Zealand 3. Climatic classification 4. Australia 5. New Guinea 6. New Zealand. I. Kidson, Edward II. Köppen, W.**

**4D–61** 551.582:656.61

U. S. Hydrographic Office, **Australia pilot.** 2nd ed. Washington, D. C., **1930–1932.** 4 v. fold. maps, plates, tables, appends. **DLC**—The several volumes cover the coast of Australia, Tasmania, islands in the Coral Sea, Torres Strait and the Inner Route and Bass Strait. Climate is dealt with in Chap. I of each volume and tables of meteorological data (for 21 stations) are found in the appendices. Geographic coordinates, altitude and length of record are given for each station. Vols. II and IV were issued in new editions in 1952. *Subject Headings:* **1. Climatic data 2. Pilot guides 3. Australia.**—*M.L.R.*

## 1933

**4D–62** 551.577.3(94)

Andrews, John and Maze, W. H., **Some climatological aspects of aridity in their application to Australia.** *Linnean Society of New South Wales, Sydney, Proceedings*, 58(245/246):105–120, **1933.** 7 figs., 2 tables, 10 refs. Abstracted from reprint. Also: **Seasonal incidence and concentration of rainfall in Australia.** *Ibid.*, p. 121–124. **NNA**—First article discusses Australian aridity, using the de Martonne (1927) relationship of rainfall to temperature. Charts show monthly indexes of aridity as well as mean duration of arid period in months. In the second article four maps show seasonal distribution of rainfall; fifth shows degree of concentration of rainfall in wettest season. *Subject Headings:* **1. Precipitation variations 2. Aridity 3. Precipitation distribution 4. Australia.**

**4D–63** 551.582.2(94)

*Australia. Council for Scientific and Industrial Research, **Meteorological data for certain Australian localities.** *Australia. Council for Scientific and Industrial Research, Pamphlet*, No. 42, **1933.** 55 p. map, 98 tables. **NNA**—Data from 98 stations for varying periods up to 1931 are

collected and tabulated. Means of monthly and annual temperature, relative humidity and rainfall are given. Map shows meteorological divisions of Australia. *Subject Headings:* **1. Climatic data 2. Australia. I. Australia. Meteorological Branch.**

**4D–64** 551.557.2(991)

Camm, H. E. and Banfield, H. E., **The frequency and velocity of the wind above Sydney . . . from pilot balloon observations at Sydney Weather Bureau during period 1926–1932.** [Sydney, 1933?] 4 p.+figs. Mimeographed. **DWB**—Wind roses summarize results of 3,231 ascents over Sydney 1926–1932, accompanied by explanatory comments. *Subject Headings:* **1. Upper air winds 2. Sydney, New South Wales.**

**4D–65** 551.5:629.13

Holmes, J. Macdonald, **Variations of wind and cloudiness in eastern Australia and their general significance to aviation.** *Institution of Engineers of Australia, Sydney, Journal,* July **1933.** p. 233–236. 3 figs., 4 refs. Also: *Sydney University Glider Club, Technical Report,* No. 20, **1933. NNA**—Some particular conditions in eastern Australia important to aviation are summarized. Sections consider: zones in the atmosphere, local ground level air behavior, gustiness of ground level winds, large scale weather behavior and squall line type weather. Synoptic type and schematic diagrams are used to illustrate particular conditions. *Subject Headings:* **1. Winds 2. Clouds 3. Aeronautical climatology 4. Eastern Australia.**

**4D–66** 551.555.6

Kidson, Edward, **The Canterbury "northwester."** *New Zealand Journal of Science and Technology,* Wellington, 14(2):65–75, Oct. **1932.** Also: **A year's wind records,** E. Kidson and M. E. Ewart. *Ibid.,* 15(3):208–221, Nov. **1933. DLC**—Wind phenomena and accompanying synoptic conditions are discussed in first item; the first year of simultaneous observations of wind at Auckland, Wellington and Christchurch reported in the second. *Subject Headings:* **1. Canterbury "northwester" 2. Wind observations 3. New Zealand. I. Ewart, M. E.**

**4D–67** 551.589

§Kidson, Edward, **Some New Zealand weather charts.** *Beiträge zur Geophysik,* 40(2/3):206–225, **1933.** 4 figs., 18 charts, 3 refs. **DLC, NNA**—An interesting and unusual sequence of weather changes in the Australia—New Zealand area Feb. 5–22, **1932,** is described by means of daily weather charts. At the same time, characteristics of air circulation in the region are noted along with manner in which cyclones of various types are formed and the way in which the characteristics of moving weather systems may be modified. Synoptic charts of the whole area and schematic rainfall charts of N. Z. for the period are included. *Subject Headings:* **1. Synoptic studies 2. Atmospheric circulation 3. Precipitation charts 4. New Zealand.**

**4D–68** 551.582(931)

Kidson, Edward, **Sunspot numbers and annual rainfall in New Zealand.** *New Zealand Journal of Science and Technology,* Wellington, 10(2):90–97, July **1928.** Also: **The flood rains of 11th March 1924 in Hawke's Bay.** *Ibid.,* 12(1):53–60, June **1930. The annual variation of rainfall in New Zealand.** *Ibid.,* 12(5):268–272, April **1931. Diurnal variation of rainfall in 1928 and 1929.** *Ibid.,* 12:331–332, June **1931. Some meteorological data for 1930–1931.** *Ibid.,* 14:119–122, **1932. Wairarapa floods of Aug. 1932.** *Ibid.,* 14(4):220–227, **1933. DLC**—First, correlation between sunspot numbers and annual rainfall pointed out. Second, synoptic conditions and damage described. Third, rainfall of New Zealand classified into three types. Fourth, some meteorological data for 1930 and 1931 presented. Fifth, synoptic conditions at the time of these heavy rains and floods analyzed. *Subject Headings:* **1. Rainfall variations 2. Floods 3. Synoptic studies 4. New Zealand.**

## 1934

**4D–69** 551.594.11

*Allen, C. W., **Atmospheric potential gradient observations at the Commonwealth Solar Observatory, Mount Stromlo, Canberra.** *Canberra, Australia. Commonwealth Solar Observatory, Mount Stromlo, Memoir,* No. 4, **1934.** 47 p. 9 figs., 14 tables, refs. **DWB**—Site, apparatus and routine of the station are described. Possible observational errors discussed and corrections derived. Features of the potential gradient are described with reference to meteorological conditions. Values of the gradient at Hotel Canberra (1926) and Mount Stromlo (1927–1932) are tabulated. Significant features of the gradient are summarized. *Subject Headings:* **1. Atmospheric potential gradient 2. Canberra, Australia.**

4D–70 551.515.4(94)

Barkley, Henry, **Thunderstorms in Australia.** *Australia. Meteorological Branch, Bulletin,* No. 19, 1934. 6 p. fold. map, 2 tables. **DWB, NNA**—Map shows isobronts indicating average annual frequency of thunder heard in Australia; brief data consist of records mostly for 1919–1928. Thunderstorm occurrence, variations, etc. in the different regions of the continent noted briefly. (*Same item as* H–41, Aug. 1950, *MAB.*) *Subject Headings:* **1. Thunderstorms 2. Australia.**

4D–71 551.586:612

Barkley, Henry, **Zones of relative physical comfort in Australia.** *Australia. Meteorological Branch, Bulletin,* No. 20, 1934. 7 p. fold. map, tables. **DWB, NNA**—Map shows degrees of discomfort over the continent. Text discusses briefly climatic conditions by region in relation to man. *Subject Headings:* **1. Climatology 2. Bioclimatology 3. Human activity 4. Australia.**

4D–72 551.577.21:551.573

Davidson, J., **The monthly precipitation-evaporation ratio in Australia, as determined by saturation deficit.** *Royal Society of South Australia, Adelaide, Transactions and Proceedings,* 58:33–36, 1934. fig., fold. map, 6 refs. **NNA**—Writer seeks to express efficiency of precipitation in relation to soil surface moisture, month by month, in Australia. Map shows areas and months in which rainfall exceeds evaporation as determined by saturation deficit. *Subject Headings:* **1. Precipitation 2. Evaporation 3. Precipitation-evaporation ratio 4. Saturation deficit 5. Australia.**

4D–73 551.557(931)

*Kidson, Edward, **Winds in the upper air at Wellington.** *New Zealand. Meteorological Office, Note,* No. 15, 1934. 8 p. 3 figs., 2 tables, refs. **DWB**—Three years (1929–1931) of observation of upper air by pilot balloons are summarized, including brief tables of seasonal percentage frequencies of visibility and height of low cloud, and seasonal upper air wind roses for different heights. *Subject Headings:* **1. Upper air data 2. Wellington, New Zealand.**

4D–74 551.509.33:551.553.21:551.577

Treloar, H. M., **Foreshadowing monsoonal rains in Australia.** *Australia. Meteorological Branch, Bulletin,* No. 18, 1934. 29 p. 5 figs., 11 tables. **DWB**—Regression formulas are derived for foreshadowing monsoon rains in 3 districts, based on preceding pressures at Darwin, Honolulu, Santiago and Buenos Aires. (*Same item as* 2B–129, Feb. 1951, *MAB.*) *Subject Headings:* **1. Long range forecasting 2. Monsoon forecasting 3. Correlations 4. Australia.**

## 1935

4D–75 551.509:551.515.8(94,931)

§Kidson, Edward and Holmboe, J., **Frontal methods of weather analysis applied to the Australia-New Zealand area.** New Zealand. Dept. of Scientific and Industrial Research, Meteorological Branch, 1935. Pt. 1. Discussion. 20 p. 6 figs. Pt. 2. Weather charts. all charts. **DWB, NNA**—Certain typical synoptic conditions in the Australia-New Zealand area have been selected for discussion in order to acquaint local meteorologists with Norwegian frontal methods and to improve their forecasting. Six series of synoptic charts are analyzed in detail. *Subject Headings:* **1. Synoptic studies 2. Weather forecasting 3. Frontal analysis 4. Australia 5. New Zealand.**

## 1936

4D–76 551.577.34

Cornish, E. A., **On the secular variation of the rainfall at Adelaide, South Australia.** *Royal Meteorological Society, Quarterly Journal,* 62:481–492, Oct. 1936. 4 figs., 5 tables, 2 refs. **DWB**—Detailed analysis of rainfall at Adelaide shows definite oscillations throughout 95 years, 1839–1933, with a period of 23 years in incidence and amplitude of 30 days in duration of winter rains. Total precipitation shows no significant change. *Subject Headings:* **1. Precipitation variations 2. Adelaide, South Australia.**

4D–77 551.585:53(94)

Prescott, J. A., **The climatic control of Australian deserts.** *Royal Society of South Australia, Adelaide, Transactions and Proceedings,* 60:93–95, 1936. map, 6 refs. **DLC, NNA**—Concluded that a satisfactory estimate of aridity of Australian desert climates can be obtained by consideration of monthly values of precipitation in relation to saturation deficit of water vapor pressure. Map shows arid zones of Australia, limits of desert climate according to KÖPPEN and extent of desert sandhills. *Subject Headings:* **1. Climatic control 2. Deserts 3. Australia.**

**4D–78** 551.586:595.7

Davidson, J., **Climate in relation to insect ecology in Australia. 1. Mean monthly precipitation and atmospheric saturation deficit in Australia. 2. Mean monthly temperature and precipitation-evaporation ratio. 3. Bioclimatic zones in Australia.** *Royal Society of South Australia, Adelaide, Transactions and Proceedings*, 58:197–209, 1934; 59:107–124, 1935; 60:88–92, 1936. fig., charts, map, table, refs. **NNA**—In the first two parts, month by month distribution of the chief climatic elements in Australia affecting temperature and moisture in the environment of insects are discussed and illustrated by monthly charts. In the third, a chart of bioclimatic zones of Australia shows numbers of months in which $\frac{P}{E}>0.5$. The importance of these zones, including their vegetation conditions, to insects is stressed. *Subject Headings:* **1. Bioclimatology 2. Insect ecology 3. Australia.**

**4D–79** 551.501.8 551.594.6

Munro, G. H., Webster, H. C. and Higgs, A. J., **Simultaneous observations of atmospherics with cathode ray direction-finders at Toowoomba and Canberra, Australia.** *Council for Scientific and Industrial Research, Bulletin*, No. 89:1–42, 1935. 15 figs., 7 tables, 44 refs. And *Ibid.*, No. 100, 1936. **DWB**—Results obtained by an expedition to Toowoomba, Queensland, are given. Simultaneous observations of directions of atmospherics at Toowoomba and Canberra produced locations of their sources. Methods of observation, site errors, etc. discussed; results give: intensities, night observations, distribution of sources, correlations with thunderstorms, general meteorological conditions associated with sources, etc. Another paper by W. J. Wark on "Atmospheric interference with reception" follows (p. 43–61, 3 figs., 9 tables, 27 refs.). He discusses origin and nature of atmospherics in Australia, calculation of the hours and degree of interference, etc. Further papers on atmospherics may be found in *Bulletin* No. 100, as follows: Munro, Wark, and Higgs, A. J., "Observations of atmospherics with a narrow sector directional recorder at Canberra." And: Boswell, R. W., "Sources of atmospherics over the Tasman Sea." *Subject Headings:* **1. Sferics 2. Radio reception 3. Australia 4. Toowoomba, Queensland 5. Canberra, Australia 6. Tasman Sea. I. Wark, W. J. II. Boswell, R. W.**

## 1937

**4D–80** 551.515.8(94)

*Cornish, Allan W., **Air masses over eastern Australia, April 1934. Part 2. Data.** *Australia. Meteorological Branch, Bulletin*, No. 21, 1937. 37 p. extensive tables. **DWB, NNA**—Paper consists entirely of data, complete as possible, of airplane soundings over eastern Australia during April 1934, with brief explanatory note. *Subject Headings:* **1. Air masses 2. Upper air data 3. Eastern Australia.**

**4D–81** 551.592.52(931)

Geddes, M., **The position of New Zealand aurorae.** *New Zealand Journal of Science and Technology*, Wellington, 19(1):55–62, June 1937. 3 figs., 2 tables, 5 refs. **DLC**—Report of observational work carried out by the Aurorae and Zodiacal Light Section of the New Zealand Astronomical Society to determine the zone in which the majority of New Zealand auroras occur. Gives heights adopted for auroral types (HA, RA, R and L) according to usual classification. A table gives heights and distances of 13 observed auroras based on single observations. Author concludes that New Zealand is more favorably situated for the study of auroras than any other habitable land mass in the Southern Hemisphere. *Subject Headings:* **1. Aurora australis 2. Auroral height 3. New Zealand.**—*M.L.R.*

**4D–82** 551.582(931)

*Kidson, Edward, **Climatic notes: New Zealand districts.** *New Zealand. Meteorological Office, Meteorological Office Note*, No. 17, 1937. 32 p. 4 figs., 21 tables, refs. **NNA**—Climatic summaries of Hawkes' Bay (p. 1–17) and North Auckland (p. 18–32) are made using some long period observations with descriptive discussion and tabulated data. *Subject Headings:* **1. Climate of New Zealand 2. Climatic data 3. Hawkes Bay, New Zealand 4. North Auckland, New Zealand.**

**4D–83** 551.582(94)

Lawrence, Elizabeth F., **A climatic analysis of New South Wales.** *Australian Geographer*, Sydney, 3(3):3–34, Nov. 1937. 10 figs., fold. plate, 8 refs. **NNA**—Author uses Köppen's climatic classification system in analyzing this region. Included are annual climatic maps of New South Wales for 1900–1935 and frequency maps for the whole period. *Subject Headings:* **1. Climate of New South Wales 2. New South Wales.**

4D–84 551.586:612(931

Macky, W. A., **Some comparisons of the invigorating effect of the climate in different parts o New Zealand.** *New Zealand Journal of Science and Technology*, 19(3):164–172, Aug. **1937.** 4 figs. 5 tables, 2 refs. Also as: *New Zealand, Meteorological Office, Meteorological Office Note*, No. 18, 1937 **NNA**—Results are presented of estimation of cooling power for several N. Z. stations, using observa tions from a katathermometer (which is described). Tables of mean cooling power, daily variability of cooling power, etc. and schematic charts of cooling rates are included. The climate of Croydo is called extreme, that of Auckland, equable and that of Wellington, invigorating. *Subject Headings* **1. Cooling power 2. Human activity 3. New Zealand.**

4D–85 551.506.1:629.13(931

*New Zealand. Meteorological Office, **Monthly frequency tables, containing observations o horizontal visibility, height of base of low cloud and speed and direction of surface and upper winds in the form approved by the International Commission for Air Navigation. Aug. 1937–Dec. 1937** Wellington, **1937.** Microfilm. **DWB**—*Subject Headings:* **1. Visibility 2. Clouds 3. Upper ai winds 4. Winds 5. New Zealand.**

4D–86 551.510.4

Palmer, C. E., **Atmospheric pollution at Wellington.** *New Zealand Journal of Science an Technology*, 19(6):377–381, Nov. **1937. DLC**—Account of observations with a dust-counter used at irregular intervals for 4 years. Particles classified. (*Same item as* A–97, Jan. 1950, *MAB.* *Subject Headings:* **1. Atmospheric pollution 2. Wellington, New Zealand.**

4D–87 551.586:6

†Trumble, H. C., **Climatic control of agriculture in South Australia.** *Royal Society of Soutl Australia, Transactions*, 61:41–62, **1937.** 6 figs., 3 fold. maps, 7 tables, 30 refs. **NNA**—Examines climatic factors affecting crop distribution in South Australia. Length of growing season shown t depend on moisture availability, which varies considerably over the state. Mean period and mean quantity of influential rainfall correlated with climate, vegetation, soil type and type of agriculture practiced. From evidence obtained, a series of edaphoclimatic zones are derived for South Australia Maps also show distribution of wheat and seeded pasture and distribution of influential rainfall in South Australia. Good bibliography, principally of agricultural nature is included. *Subject Headings:* **1. Agricultural climatology 2. Climatic classifications 3. South Australia.**

## 1938

4D–88 551.506:551.577.21(94

*Australia. Meteorological Branch, **Australian rainfall in district averages.** *Australia. Meteorological Branch, Bulletin*, No. 23, **1938.** 56 p. fold. map, 100 tables. **NNA**—Complete sequence of rainfall averages of 100 districts of Australia derived from regular observations, 1913–1936. Map shows the rainfall divisions. *Subject Headings:* **1. Precipitation data 2. Australia.**

4D–89 551.515.2(931

§Barnett, M. A. F., **The cyclonic storms in northern New Zealand on the 2nd February and the 26th March, 1936.** *New Zealand. Meteorological Office, Meteorological Office Note*, No. 22, 1938 34 p. 19 figs. **DWB**—Detailed account is given of these 2 cyclones of tropical origin, the first was of exceptional severity. Their early developments are described, using synoptic charts. Notes on general characteristics and frequency of cyclones over North Island are included. *Subject Headings:* **1. Cyclonic storms 2. New Zealand.**

4D–90 551.515.2(94

Hennessy, J., **Western Australian hurricanes.** *Marine Observer*, 15:18–19, **1938.** 2 charts **NNA**—Brief discussion of general characteristics of Western Australian hurricanes. Some tracks for Nov.–Jan. and Feb.–April are shown on charts. *Subject Headings:* **1. Hurricanes 2. Western Australia.**

4D–91 551.591(931) 551:557(931

*Larsen, L. N., **Visibility and upper winds at Auckland, Wellington, and Christchurch.** *New Zealand. Dept. of Scientific and Industrial Research, Meteorological Office Note*, No. 20, **1938.** 27 p 6 figs., 18 tables, 3 refs. **DLC**—Includes data for Auckland for March 1939–Feb. 1931 and Christchurch from 1930–1935, inclusive. Extends data for Wellington to end of 1935 (*see* 4D–73 above) A total of 3,582 pilot balloon ascents were made at the 3 stations. Tables give seasonal and annual frequencies of visibility and low cloud at Auckland and Christchurch. Seasonal and annual wind

roses, with tables on which they are based, are presented for all 3 stations. *Subject Headings:* **1. Visibility 2. Upper air wind data 3. Auckland, New Zealand 4. Wellington, New Zealand 5. Christchurch, New Zealand.**—*M.L.R.*

**4D–92** 551.524.3

§Loewe, Fritz, **Über die interdiurne Temperaturveränderlichkeit im aussertropischen Australien.** [On interdiurnal temperature variations in extra-tropical Australia.] *Meteorologische Zeitschrift*, 55(5):177–183, May **1938.** 9 tables, 10 refs. **NNA**—Daily and seasonal temperature variations in Australia are studied using a five year series of observations from 14 stations. *Subject Headings:* **1. Temperature variations 2. Australia.**

**4D–93** 551.584.2(931)

Macky, W. A., **Climatological observations at Eastbourne, Wellington, and some comparisons.** *New Zealand. Meteorological Office, Meteorological Office Note*, No. 21, **1938.** 16 p. 4 figs., 12 tables. **DWB**—Results of 10 months of observation at Eastbourne, suburb of Wellington, to determine variations in the immediate area and to correlate these variations with the topography. *Subject Headings:* **1. Microclimatology 2. Topographic effects 3. Eastbourne, New Zealand.**

**4D–94** 551.583

Madigan, C. T., **Desiccation in Australia.** *Australian Journal of Science*, Sydney, 1(1):26–28, Aug. 22, **1938.** **NNA**—Noted that there is no clear evidence that desiccation is continuing in Australia at the present time; however, evidences of drier periods in earlier geologic time are pointed out. *Subject Headings:* **1. Desiccation 2. Climatic changes 3. Australia.**

**4D–95** 551.582:63(94)

Prescott, J. A., **The agricultural possibilities of monsoonal Australia.** *Royal Geographical Society of Australasia, South Australian Branch, Proceedings*, 39:52–60, **1937/38.** fig., 12 photos. **NNA**—Area includes most of tropical northern Australia. Length of growing season, agricultural zones and soils are considered. Brief comparison with other similar climates made. Possible crops for a system of agriculture and those suited to monsoonal climates are listed. *Subject Headings:* **1. Agricultural climatology 2. Tropical Australia.**

**4D–96** 551.577.22:551.590.21

*Quayle, E. T., **Australian rainfall in sunspot cycles.** *Australia. Meteorological Branch, Bulletin*, No. 22, **1938.** 56 p. fold. map, 3 tables, refs. **NNA**—Elaborating on his original paper (*Royal Society of Victoria, Proceedings*, 37(2):131–143, 1925), in which he pointed out that in the Australian area the response to changes in solar activity as indicated by the sunspot numbers differed in phase throughout the continent, the author now distinguishes between responses of summer and winter seasons and shows how far successive cycles approximate mean relationships in phase and amplitude. Tables show average summer and winter rains in sunspot cycles and variations from average summer and winter rains in sunspot cycles at various stations. *Subject Headings:* **1. Precipitation variations 2. Cycles 3. Sunspot effects 4. Australia.**

**4D–97** 551.582:629.13

*Treloar, H. M. and Newman, B. W., **Weather conditions affecting aviation over the Tasman Sea. Pt. 1 and 2.** *Australia. Meteorological Branch, Bulletin*, No. 24, **1938.** **DWB**—Pt. 1, "Weather conditions from records of ships' logs and land observations" (34 p., 3 figs., 30 plates, tables), consists of discussion, tables and maps of general weather conditions over the Tasman Sea and across the route from Sydney to North Island, New Zealand, noting especially elements of importance to aviation, such as thunderstorm distribution, fog frequency, occurrence of different cloud types, summary tables of weather data, visibility, cloud levels and directions, maps showing monthly distribution of data in each 5° sq, percentage frequencies of particular winds and lower cloud types, precipitation frequency, Lord Howe and Norfolk Islands data, all collected from observations of ships and land stations 1924–1935. Pt. 2, "Some adverse aviation weather conditions on the New South Wales coast" (4 p., 6 tables), contains particulars of incidence of fog, low cloud and poor visibility at Sydney and parts of New South Wales coast. *Subject Headings:* **1. Aeronautical climatology 2. Visibility 3. Clouds 4. Fog 5. Sydney—New Zealand air route 6. Tasman Sea 7. New South Wales coast 8. Lord Howe Island 9. Norfolk Island.**

**4D–98** 551.557:629.13

Treloar, H. M., Newman, B. W. and Newell, H. F., **Weather conditions affecting aviation over the Tasman Sea. Pt. 3. Winds in the free atmosphere.** *Australia. Meteorological Branch, Bulletin*, No. 25, **1938.** 23 p. 9 figs., 11 charts, 19 tables. **NNA**—Consists of three sections: 1) The effect of winds on times of flight, 2) Occasions of large increases of wind with height and

3) Wind velocities in the 5 km level. Data and methods employed are discussed, followed by deductions regarding times of crossings of the Tasman Sea, large increases of wind with height, and winds at 16,000 ft. *Subject Headings:* **1. Aeronautical climatology 2. Upper air winds 3. Tasman Sea.**

**4D–99** 551.586:631

Zotov, V. D., **Some correlations between vegetation and climate in New Zealand.** *New Zealand Journal of Science and Technology*, 19(8):474–487, Jan. **1938.** 2 figs., 9 refs. **DLC, NNA**—Belts of various plant species are designated according to temperature rather than altitude and are determined by summer temperature rather than duration of winter snow. This system is applied to distribution of *Nothogagus* and to causes of the timber line. Views are based mainly on observations during several years in the Gararua Mountains and corroborated by evidence from various other New Zealand localities. Botanical districts are designated by differences in summer rainfall and temperature. *Subject Headings:* **1. Vegetation 2. Climatic zones 3. New Zealand.**

## 1939

**4D–100** 551.582(931)

Kidson, Edward, **The climate of the Heretaunga plains.** *New Zealand. Dept. of Scientific and Industrial Research, Bulletin*, 70:12–17, **1939.** 2 figs., 8 tables. **NNA**—The principle climatic elements are discussed for this region adjacent to Hawke's Bay, including Napier-Hasting area, with schematic diagrams and summary data. Reviews relation between climate and agriculture. *Subject Headings:* **1. Climatology 2. Agricultural climatology 3. Heretaunga Plain, New Zealand.**

**4D–101** 551.577.2(94)

Rimmer, T., Hall, K. N. S. and Hossack, A. W. W., **An analysis of Queensland rainfall, 1925–1936.** *Queensland, University, Brisbane. Dept. of Physics, Papers*, 1(1), **1939.** 13 p. 3 figs. 4 tables, ref. Also: **Queensland cyclones and their influence on monthly rainfall.** *Ibid.*, No. 2 20 p. fig., 8 tables. **Foreshadowing summer rain in Queensland.** *Ibid.*, No. 3. 15 p. 3 figs. 6 tables, 7 refs. **NNA, DWB**—1) From study of daily weather charts and classification of Queensland rainfall, monthly and annual variations, characteristics, etc., it is concluded that in northern coastal regions rain depends on instability and cyclonic activity while in interior it depends on frontal discontinuities other than cyclones. 2) Relations between number of times good rain at each station was independent of or dependent on cyclones calculated. 3) Correlation coefficients are given between rainfall in 7 districts of Queensland and world weather. (*Same item as* 2B–158, Feb. 1951, *MAB.*) *Subject Headings:* **1. Precipitation 2. Long range forecasting 3. Correlations 4. Cyclones 5. Queensland, Australia.**

**4D–102** 551.586:63

Trumble, H. C., **Climatic factors in relation to the agricultural regions of Southern Australia.** *Royal Society of South Australia, Adelaide, Transactions*, 63(1):36–43, **1939.** 6 figs., 3 refs. **NNA**—Author's climatic classification methods (*see* 4D–87 above) for South Australia are reviewed in the light of further information. Map shows the agro-climatic zones of southern Australia generally, based on mean length of rainfall season and mean winter temperatures. Concluded that the use of mean values appears to be satisfactory for climatic zoning in southern Australia, although variability factor requires further investigation. *Subject Headings:* **1. Agricultural climatology 2. Climatic classifications 3. South Australia.**

## 1940

**4D–103** 551.582.3(94)

Australia. Bureau of Meteorology, **Climatological atlas of Australia.** [Melbourne **1940.**] 74 p. chiefly charts, appends. **DLC**—Atlas presents annual and monthly maps of maximum, minimum and mean temperature and rainfall, maps of relative humidity (9 a.m. and 3 p.m.) and pressure (0900 and 1500 hrs) for selected months and the year and annual maps of normal distribution of sunshine and thunderstorm frequency. List of stations and station location map are included. *Subject Headings:* **1. Climatic charts 2. Atlases 3. Australia.**—*A.A.*

**4D–104** 551.5:629.13(02)

§Australia. Bureau of Meteorology, **R. A. A. F. Manual of meteorology.** *Australia. Royal Australian Air Force, Publication*, No. 153, **1940.** 176 p. figs., biblio. **DWB**—Good training manual based on most of the available standard texts. Weather elements are discussed, then particular hazards to aviation: icing, thunderstorms, line squalls, fog, tropical cyclones, dust, etc.—usually with applications to Australia. The last part considers weather and synoptic conditions in Australia. *Subject Headings:* **1. Aeronautical meteorology 2. Training manuals 3. Textbooks 4. Australia. I. Australia. Royal Australian Air Force.**

**4D–105** 551.506.3 551.582.2(94,931)

*Great Britain. Meteorological Office, Réseau Mondial, **Monthly and annual summaries of pressure, temperatures, and precipitation at land stations, generally two for each ten-degree square of latitude and longitude [1910–1932].** London, H. M. Stationary Office [1920–1940]. 23 v. fold. maps, tables. Title varies.—Data for 33 stations in Australia, New Zealand, Tasmania and nearby islands will be found in zones 10–13. (*Same item as* 3C–13, March 1952, *MAB.*) *Subject Headings:* **1. Climatic data 2. World weather records 3. Réseau Mondial 4. Australia 5. New Zealand. I. International Meteorological Committee II. Brooks, C. E. P.**—*M.L.R.*

**4D–106** 551.574.7

§Hogan, J., **Ice accretion on aircraft in Australia.** *Australia. Meteorological Branch, Bulletin,* No. 26, **1940.** 48 p. numerous synoptic charts, tables, refs. **DWB**—Thorough synoptic analyses of conditions for ice formation on aircraft are given for various regions of Australia. (*Same item as* I–59, Sept. 1950, *MAB.*) *Subject Headings:* **1. Icing of aircraft 2. Australia.**

**4D–107** 551.582(94)

†Lawrence, Elizabeth F., **Australian climatology; a review of some recent work.** *Australian Geographer,* Sydney, 3(7):29–35, March **1940.** 3 figs., 31 refs. **NNA**—Discussion of different climate classification systems as they have been applied to Australia, with many references. The charts show bioclimatic zones of Australia, effective rainfall amounts in South Australia and effective rainfall and agroclimatic zones of South Australia. *Subject Headings:* **1. Climatic classifications 2. Bioclimatology 3. Agricultural climatology 4. South Australia 5. Australia.**

**4D–108** 551.506.7(94)

*Loewe, Fritz, **Discussion of eight years of aerological observations obtained by means of aeroplanes near Melbourne.** *Australia. Meteorological Branch, Bulletin,* No. 27, **1940.** 38 p. 7 figs., 58 tables, 33 refs. **NNA**—Results of 2300 aerological flights, 1931–1939, near Melbourne are statistically studied. Discussion and tables are included for average monthly temperatures, vertical lapse rates, temperature variabilities, correlations between ground temperature deviations and those of higher levels, temperature inversions, average relative and specific humidities, pressure and densities at different levels, etc. *Subject Headings:* **1. Upper air data 2. Melbourne, Victoria.**

**4D–109** 551.543

Seelye, C. J., **Atmospheric pressure variation at Wellington.** *New Zealand Journal of Science and Technology, Sec. B,* 21(5):241–255, March **1940.** 8 figs., 9 tables, 11 refs. **NNA**—Daily atmospheric pressure variation at Wellington analyzed; interdiurnal and monthly variabilities investigated. Representative data and schematic charts included. *Subject Headings:* **1. Pressure variations 2. Wellington, New Zealand.**

**4D–110** 551.577.3

Seelye, C. J., **Variability of annual rainfall in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B,* 22(1):18–21, July **1940.** fig., table, 3 refs. **NNA**—Percentage variability of annual rainfall in New Zealand is noted; distribution shown on map; data on extreme annual falls in different districts included. *Subject Headings:* **1. Precipitation variations 2. New Zealand.**

## 1941

**4D–111** 551.582(94)

Lawrence, Elizabeth F., **Climatic regions in tropical Australia.** *Australian Geographer,* Sydney, 4(1):20–26, March **1941.** 3 tables, 3 refs. **NNA**—Method of analyzing regions discussed, and the regions of northern Australia classified, with the conclusion that great variability in length of growing season and amount of rain exists. Summary tables give various monthly frequencies of rainfall from stations of several major regions. Frequency of good and bad years noted. *Subject Headings:* **1. Climatic regions 2. Rainfall frequencies 3. Northern Australia.**

**4D–112** 551.510.42

*Phillips, M. E., **Studies in atmospheric pollen.** *Medical Journal of Australia,* Sydney, 2:189–198, **1941.** 4 figs., 3 tables, numerous refs. **DSG**—Pollen counts made from collections at 11 stations of Australia. Correlations between pollen counts and weather data charted. (For fuller abstract *see item* B–42, Feb. 1950, *MAB.*) *Subject Headings:* **1. Pollen 2. Meteorological elements 3. Aerobiology 4. Australia.**

**4D–113** 551.583

Süssmilch, C. A., **The climate of Australia in past ages.** *Royal Society of New South Wales, Journal and Proceedings,* 72(2):47–64, **1941.** tables, diagrs. **DLC**—A detailed summary from

Archaeozoic to present. Results shown in a curve of temperature, with glaciations in older Archaeozoic, Proterozoic, Carboniferous—Permian, Lower Cretaceous and Pleistocene. Another diagram generalizes changes of rainfall and temperature in Queensland since Miocene. (*Same item as* G–105, July 1950, *MAB.*) *Subject Headings:* **1. Climatic changes 2. Glaciation 3. Australia.**—*C.E.P.B.*

## 1942

**4D–114** 551.577.3(94)

Andrews, John, **Rainfall reliability in Australia.** *Linnean Society of New South Wales, Sydney, Proceedings*, 57(239–240), Pts. 1/2:95–100, **1942.** 3 maps, 4 refs. **NNA**—The most frequently occurring annual amount of rainfall is determined for numerous Australian stations and isohyets charted. A percentage rain reliability map is also included. *Subject Headings:* **1. Precipitation variations 2. Precipitation distribution 3. Australia.**

**4D–115** 551.582:629.13(94)

Australia. Meteorological Services, **Climatic and meteorological conditions particularly affecting aviation . . .** [in various regions of Australia]. *Australia. Meteorological Services, Research Report, Ser.* 7, **1941, 1942.** Most contain tables, maps. **GB-MO**—Climatic and meteorological conditions on Cape York Peninsula (6 p.); . . . in Midlands, Tasmania (1 p.); . . . in vicinity of Exmouth Gulf, Western Australia (2 p.); . . . in the Williamstown (N.S.W.) district . . . in the Nowra (N.S.W.) district . . . in the Moruya Heads (N.S.W.) district (7 p.); . . . at Nabiac, N.S.W. (2 p.); . . . in the Evans Head N.S.W. district . . . at Canberra and surrounding districts (plate of surface and upper wind roses at Canberra) . . . over areas from Cooktown (North Queensland) to Papua, Mandated Territories of New Guinea, Solomon Islands, New Hebrides and New Caledonia (16 p.); . . . in the Mildura-Wentworth-Lake Victoria district. (Upper wind roses for Adelaide, surface wind and visibility table) . . . in the Coff's Harbour (N.S.W.) district. These reports include climatic data, surface and upper winds, visibility, air density and lists of long wave broadcasting stations. *Subject Headings:* **1. Aeronautical climatology 2. Australia.**—*C.E.P.B.*

**4D–116** 551.515.8(94) 551.543.1

Australia. Meteorological Services, **Some points in the technique of frontal analysis in Australia.** *Australia. Meteorological Services, Circular AMFA* T.1; T.1/3.63; T.1/3.3, July **1942.** 7 p. Mimeographed. **DWB**—Contents include an outline of technique; section on location of fronts by temperature, humidity, ground wind, pilot balloon winds, cloud and pressure; and a section on speed of fronts considering goestrophic wind, observed winds, pressure tendencies and timing. AMFA T.1/3.63 contains corrections to pressure tendencies for diurnal pressure oscillation during different months. AMFA T.1/3.3 consists of four charts on seasonal mean sea surface temperatures in Australian-New Zealand waters. *Subject Headings:* **1. Frontal analysis 2. Diurnal pressure oscillations 3. Sea surface temperatures 4. Australia 5. New Zealand.**

**4D–117** 551.509.33 551.582(94) 551.525 551.577.2 551.521.1 551.590.2

***Crohamhurst Observatory Papers.** Nos. 1–12. Brisbane, 1935–**1942.** Inigo Jones, director. **NNA**—No. 1 (1935), "The Crohamhurst Observatory; its location and functions and the inaugural ceremony" (16 p., no data). No. 2 (not at NNA) "Elements of Crohamhurst, 1892–1935." No. 3 (1936). "Observations of deep earth temperatures at the Botanic Gardens, Brisbane, 1928–1935 and at Crohamhurst Observatory 1935 from 1st June." Also: "The sea surface temperatures at the Pile Lighthouse, Moreton Bay," and: "The solar constant of radiation at Montezuma, Chili and at Table Mountain" (entirely tables with introductory comments) No. 4 (1936) "Tables of rainfalls in Queensland for the years, 1933–1935" (16 tables of monthly and annual rainfall values for 155 stations of Queensland). No. 5 (1936) "Data from Australian observations for the period 1770–1853." With all available rainfall figures. Collected as evidence of the repetition of the weather in cycles, under the hypothesis now being investigated at the Crohamhurst Observatory" (23 p. tables). Brief summary of each year's weather with some summary data. No. 6 (1936) "The climate of Australia during the hypothetical Jovian sunspot cycles 1853–1876 together with the rainfall observations taken in Australia since 1822 by years to 1876 with some comments on the evidence of cyclical reproduction in that period" (39 p. tables). No. 7 (1937) (same title as No. 6) ". . . 1877–1901 together with monthly and annual rainfall observations at selected stations during that period and some comments on the evidences of cyclical reproduction of the weather" (123 p., tables). No. 8 (1938) (same title as No. 6) ". . . 1901–1913 . . . and the immediate and other effects of sunspot changes" (94 p., tables). No. 9 (1938) (same title as No. 6) ". . . 1913–1924 . . ." (111 p., tables). No. 10 (1939) "On the methods adopted as a means of seasonal forecasting at Crohamhurst," by Inigo Jones (*see item* 2B–155, Feb. 1951 *MAB*). No. 11 (1940) "Rainfall in Queensland; tables showing monthly and annual rainfall totals at 110 selected stations covering all available years of record up to and including 1939" (138 p. extensive tables). No. 12 (1942) "The

elements of Crohamhurst, 1892–1942" (16 tables). Monthly and annual means, maxima, etc., values for temperature, precipitation, wind direction and cloud amount at the observatory (near Brisbane) for the 50-year period are tabulated. *Subject Headings:* **1. Crohamhurst Observatory, Queensland 2. Climatology 3. Sunspot effects 4. Solar radiation 5. Precipitation 6. Earth temperatures 7. Sea surface temperatures 8. Long range forecasting 9. Crohamhurst, Brisbane, Queensland 10. Australia. I. Jones, Inigo.**

**4D–118** 551.582.1(94)

Dyche, William R. and others, **Physical features and climatology of Australia and New Zealand.** (In: California Institute of Technology, **Military Climatology.** v. 1, **1942.** 65 p. maps, diagrs.) **DWB**—General summary review of climatological and meteorological conditions of Australia and New Zealand with schematic charts and selected weather maps. *Subject Headings:* **1. Climatology 2. Australia 3. New Zealand.**

**4D–119** 551.586:631:581.9(94)

Gardner, Charles Austin, **The vegetation of Western Australia with special reference to the climate and soils.** *Royal Society of Western Australia, Perth, Journal and Proceedings*, 28:xi–lxxxvii, **1941/1942.** 9 maps, 5 tables. **NNA**—General discussion of Western Australian flora and its relations to climate, geology and soils. Contents include consideration of: types of flora; physiography, geology, soils and climate, including climatic cycle, temperature, evaporation, etc.; relationships between climate and vegetation; the three provinces of Western Australia and their floristic formations; epharmosis and growth forms and, finally, tables of climatic means and some vegetation-climate maps. *Subject Headings:* **1. Bioclimatology 2. Vegetation 3. Western Australia.**

**4D–120** 551.582(94) 551.587

Loewe, Fritz, **The distribution of temperatures, pressures, humidities and densities between sea level and 40,000 feet in Australia and lower latitudes.** *Australia. Meteorological Services, Research Reports, Ser. 10*, No. 5, **1942.** 11 p. fig., tables. **DWB**—Tables extrapolated from reliable averages up to 16,000 ft for Melbourne, Sydney and Perth enable generalized conclusions to be drawn regarding the distribution of elements up to 40,000 ft over a wide area in southern latitudes. *Subject Headings:* **1. Upper air temperatures 2. Upper air pressure 3. Upper air humidity 4. Upper air density 5. Australia.**

**4D–121** 551.509.31

§Palmer, C. E., **Synoptic analysis over the Southern Ocean.** *New Zealand. Meteorological Office, Professional Note*, No. 1, Feb. **1942.** 38 p. 13 figs.,+39 plates, 5 tables, 33 refs. **DWB**—First section gives a brief survey of previous work on the southern circulation, particularly on the Australian migratory anticyclone. Pt. 2 discusses the nature of the low pressure trough between two Australian anticyclones and some of the features of the atmospheric circulation over the Tasman Sea. Pt. 3 begins the exploration of the weather systems of the South Indian Ocean. The work is liberally illustrated with synoptic charts. *Subject Headings:* **1. Synoptic analysis 2. Anticyclones 3. Atmospheric circulation 4. Southern Ocean 5. Tasman Sea 6. South Indian Ocean.**

**4D–122** 551.524.2(94)

Prescott, J. A., **The phase and amplitude of the Australian mean monthly temperatures.** *Royal Society of South Australia, Adelaide, Transactions and Proceedings*, 66:46–49, **1942.** 3 figs., 3 refs., eqs. **DLC**—Significant differences in the phase of the temperature curves are observed for different parts of Australia in a study of relationship between temperature and evaporation at certain Australian stations. All available data have been examined by the method of Fourier analysis, and three principal constants of the curve representing the march of monthly temperatures can be calculated. Equations are included. *Subject Headings:* **1. Temperature 2. Evaporation 3. Australia.**

**4D–123** 551.515.8(94)

Squires, P., **Some points in the technique of frontal analysis in Australia.** *Australia. Meteorological Services, Research Report, Ser. 8*, No. 1, **1942.** 10 p. diagrs. **DWB**—Means for frontal analyses in the area extending from middle latitudes to 15°S are discussed. Techniques are outlined and frontal locations, temperature, humidity, ground and upper winds, cloud and pressure are considered. Finally, speed of fronts, geostrophic wind, observed winds, pressure tendencies and timing are taken up. *Subject Headings:* **1. Frontal analysis 2. Australia.**

4D–124 551.576.11:629.13

Treloar, H. M., **Report on formation of aeroplane cloud trails with reference to Australian and lower latitudes.** *Australia. Meteorological Services, Research Reports, Ser. 10,* No. 4, June 1942. 5 p. **DWB**—Some observations of cloud trails listed. Explanation and theory of cloud trails given. (*Same item as* 2I–89, Sept. 1951, *MAB.*) *Subject Headings:* **1. Condensation trails 2. Exhaust trails 3. Supersaturation 4. Australia.**

## 1943

4D–125 551.582:629.13(94)

§Australia. Meteorological Branch, **Meteorological conditions over. . . .** [Australian air routes.] Melbourne [**1941, 1942, 1943**]. tables and maps in each. Mimeographed. **GB-MO**—Meteorological conditions over Sydney-Adelaide air route (including Mildura-Broken Hill route), 19 p.; . . . Sydney-Brisbane air route, 12 p.; . . . Perth-Wiluna-Kalgoorlie air route, 10 p.; . . . Perth-Darwin air route, 19 p. Supplement, . . . affecting aviation around south-west corner of Western Australia between Perth and Albany . . . Melbourne-Hobart air route, 10 p.; . . . Daly Waters-Cloncurry-Charleville-Brisbane air route, 11 p.; . . . Brisbane-Thursday Island air route, 14 p.; . . . Melbourne-Adelaide air route (via Nhill and Mt. Gambier and including Melbourne-Hamilton route), 11 p.; . . . Sydney-Melbourne air route, 15 p.; . . . Perth-Adelaide air route, 10 p.; . . . Indian Ocean air route between Exmouth Gulf, W. Australia, and Colombo, Ceylon, 14 p. Text and tables include pressure distribution and associated weather, surface and upper winds, air density, cloud, visibility, precipitation, special phenomena, bumpiness and turbulence, icing, temperature and humidity. Maps show typical synoptic situations. *Subject Headings:* **1. Aeronautical climatology 2. Airways climatic data 3. Australia.**—*C.E.P.B.*

4D–126 551.577.2/3(94):551.577.36

*Australia. Meteorological Branch, **Rainfall; normal monthly and yearly amounts of rainfall and number of rain days. Standard period 30 years, 1911–1940.** [Canberra, **1943.**] 169 p. all tables, map. *Australia. Meteorological Branch, Book of Normals,* No. 1. **NNA**—Means for stations in 99 rainfall divisions (about 2000 stations) of Australia (shown on map) are given. *Subject Headings:* **1. Rainfall normals 2. Rainfall frequencies 3. Australia. I. Timcke, E. W.**

4D–127 551.515.8(94, 265)

§Hogan, J. and Maher, J. V., **A paper on the Australian cold fronts over the Coral Sea and its environments.** *Australia. Meteorological Services, Research Reports, Ser. 10,* No. 12; 13, **1943.** 23 p. 17 figs., tables, refs.; 4 maps. Rev. ed. of No. 12: *U. S. Office of Naval Operations, Aerological Section, NAVAER* 50-1R-82, **1944. DWB**—The passage of cold fronts from the Queensland coast to New Guinea is discussed, using along unbroken series of observations from Willis Island in the Coral Sea. Thirteen analyzed charts are used, together with some general information to assist in fuller synoptic analysis. Report No. 13, consists of 4 maps showing normal atmospheric pressure over the area between long. 95°E and 170°W and from lat. 20°N to 45°S. *Subject Headings:* **1. Frontal analysis 2. Atmospheric pressure 3. Australia 4. Coral Sea.**

4D–128 551.510.42:551.555.8

§Loewe, Fritz, **Duststorms in Australia.** *Australia. Meteorological Branch, Bulletin,* No. 28 **1943.** 16 p. 17 figs., refs. **DWB, NNA**—Conditions for occurrence of Australian duststorms are enumerated: strong turbulent wind blowing for some time in drier regions, warm temperatures, dry conditions, various air mass and frontal characteristics and other more complex conditions as applied to different regions. Several synoptic charts with duststorms are included. The necessary unstable air stratification and its effects are discussed. Methods of S. Petterssen are considered useful in obtaining knowledge of pressure field development for forecasting duststorms along with knowledge of general weather and vegetation conditions, time of day, etc. *Subject Headings:* **1. Dust storms 2. Dust storm forecasting 3. Australia.**

4D–129 551.509.3:629.13:551.58

*§New Zealand. Meteorological Office, **Miscellaneous meteorological notes. Ser. A.** No. 1–10 (No. 9 missing), **1943.** figs., charts, tables. **DLC**—A series of papers for information and education of Air Force officers. Each is amply illustrated with schematic diagrams, synoptic charts and data. Articles applicable to the New Zealand region are: No. 2 by C. G. Green, "Some characteristics of migratory anticyclones in the New Zealand area." No. 4 by M. A. F. Barnett, "Note on sea surface temperature between New Zealand and Samoa." Nos. 7 and 8 by J. W. Hutchings, "Orographical disturbances of the pressure field over New Zealand" and "Orographical cyclogenesis over New Zealand." No. 10 by C. J. Seelye, "Notes on dew-point temperatures in New Zealand." Others listed in *item* 9–37, Sept. 1950, *MAB. Subject Headings:* **1. Aeronautical climatology**

**2. Ocean temperatures 3. Anticyclones 4. Orographic effects 5. Cyclogenesis 6. Temperature 7. New Zealand 8. South Pacific. I. Green, C. G. II. Barnett, M. A. F. III. Hutchings, J. W. IV. Seelye, C. J.**

**4D–130** 551.509.33

Treloar, H. M., **Extended forecasts or weather statements.** *Australia. Meteorological Services, Research Reports, Ser. 10,* No. 15, **1943.** 5 p. **DWB**—Important practical methods to aid in development of extended forecasting, primarily in subtropical Australia, are discussed. *Subject Headings:* **1. Extended forecasting 2. Subtropical Australia.**

## 1944

**4D–131** 551.509.3

§Australia. Meteorological Services, **Forecasting weather in the Australian equatorial regions.** [Melbourne?] **1943–1944.** *Australia. Meteorological Services, Research Reports, Ser. 10,* No. 11, **1943.** 63 p. fig., tables. And: No. 17, **1944.** p. 63–180. 33 figs., tables. **DWB**—The work consists of three parts. The first is an introduction on general and equatorial forecasting theories and techniques. The second, on climatology, considers the following topics: seasons in equatorial regions, equatorial climate, weather conditions and rainfall in equatorial regions adjacent to Australia; clouds, thunderstorms, visibility, surface winds, ice accretion on aircraft, rainfall types, hail, gales and squalls, with 20 refs. The third part, on synoptic meteorology, takes up air masses in general, and in Australia and the Southwest Pacific area in particular, southern maritime air masses, tropical Tasman air masses, modified polar Asian air masses or "northers," tropical continental air masses of Australia, north Pacific trades and tropical Indian air masses, their properties, sources, modifications, trajectories and extent, associated flying weather, fronts, etc. *Subject Headings:* **1. Tropical meteorology 2. Weather forecasting 3. Tropical climatology 4. Synoptic studies 5. Air masses 6. Tropical Australia 7. Indonesia 8. Tropical Pacific Ocean.**

**4D–132** 551.582:631.4:551.311.3(931)

Cumberland, K. B., **Climatic characteristics affecting the incidence and morphology of soil erosion in New Zealand.** (In his: **Soil erosion in New Zealand: a geographic reconnaissance.** Wellington, **1944.** Append. II, p. 138–150. fig., 3 tables, refs.) 2nd ed. 1946. **NNA**—The principle climatic elements of New Zealand which affect manner and rate of hastened erosion, i.e., range of temperature; amount of frost; amount, intensity, variability and seasonal incidence of precipitation; variability of humidity and evaporation and wind, are summarized and their effects in the various regions of N. Z. noted. *Subject Headings:* **1. Climatic effects 2. Soil erosion 3. New Zealand.**

**4D–133** 551.515(94)

§Gibbs, W. J., **Notes on the frontology of Northern Australia and adjacent islands.** [1944?] 10 p. 13 figs., refs. **DWB**—Author shows how to determine the tropical front, using trajectories and equivalent potential temperature in order to find the air mass boundaries, and how to compute the slope, movement, intensity and life of tropical fronts. The conditions in the upper air and the influence of topography are discussed. A few characteristic synoptic cases are studied. Em air extends to considerable height but other air masses are relatively shallow. *Subject Headings:* **1. Tropical fronts 2. Northern Australia.**—*A.A.*

**4D–134** 551.582(93, 943):656.61

*Great Britain. Hydrographic Office, **Australia pilot.** 3rd ed. London, **1934–1944.** 5 v. illus., fold. maps, bibliog. **DLC**—A general description of climate and weather is given in the first chapter of each volume and meteorological data also included in Chap. I of Vol. II. In other volumes full climatological tables for 18 stations will be found in the appendices. A fourth edition of Vol. 4 was issued in 1951 (*see item* 4.1–212, Jan. 1953, *MAB*) and of Vol. 5 in 1948. *Subject Headings:* **1. Climatic data 2. Pilot guides 3. Australia.**—*M.L.R.*

**4D–135** 551.575.2(94)

*§Loewe, Fritz, **Coastal fogs in Australia.** *Australia. Meteorological Branch, Bulletin,* No. 31, **1944.** 19 p. 7 figs., 13 tables, refs. **NNA**—Tables give average number of days of fog at various stations in the different states per month, percentage distributions, days of dense fog per year, distribution of low visibility, along with some forecasting hints suggested by the statistical studies. Some typical cases of extended coastal fog are enumerated with pressure maps for these periods. Finally, overall weather conditions connected with extended coastal fogs are summarized. In general, emphasis is placed on practical aspects of fog, particularly as concerning aircraft. *Subject Headings:* **1. Fog 2. Visibility 3. Aeronautical climatology 4. Fog forecasting 5. Australia.**

**4D–136** 551.577.2(931)

*Seelye, C. J., **Wellington city rainfall.** *New Zealand Journal of Science and Technology, Sec. B,* 26(1):36–46, July **1944.** 4 figs., 15 tables. **NNA**—Using continuous daily rainfall data from Wellington since 1862, annual and monthly means, extremes, daily rainfall frequencies, numbers of rain days, frequency of droughts, etc. are calculated, and data given in small summary tables and graphs. *Subject Headings:* **1. Precipitation 2. Wellington, New Zealand.**

**4D–137** 551.582:621.396.9

§Treloar, H. M., **Meteorological factors in four situations in which abnormal radar propagation occurred off Cape Moreton.** *Australia. Meteorological Services, Research Report, Ser. 10,* No. 19, **1944.** 7 p.+15 maps. **DWB**—Four occasions of outstanding radar abnormalities are broken down into sectional meteorological situations significant for radar propagation. Meteorological situation is specified, and the possible radar effect tentatively stated. Synoptic charts of eastern Australia are appended. *Subject Headings:* **1. Radar meteorology 2. Radar propagation 3. Cape Moreton, Queensland.**

**4D–138** 551.553.11:621.396.9

Treloar, H. M., **Radar meteorological report—probable radar ducts in September in region including north Australia and islands to the north and some general matters.** *Australia. Meteorological Services, Research Report, Ser. 10,* No. 20, **1944.** 21 p. 5 fold. charts, tables. **DWB**—Author considers the classes, distribution and intensity of warm, dry winds moving out over the sea and the heights of the resultant radar ducts. He states that in such air streams combined rapid vertical fall of humidity and some vertical increase of temperature cause long ranges. His research is theoretical, and results tentative, but of use to practical researchers in this region. *Subject Headings:* **1. Radar meteorology 2. Radar propagation 3. Northern Australia.**

**4D–139** 551.582.3(94)

U. S. Quartermaster Corps, Research and Development Branch, Climatology Unit, **Climatic zones. Australasia.** *U. S. Army Map Service, Sheets CZ* 9-1/9-12, **1944.** 12 sheets (1 for each month). **NNA**—Colored maps show mean climatic conditions (temperature and precipitation) for each month in Australia, New Zealand, New Guinea and adjacent lesser islands. *Subject Headings:* **1. Climatic charts 2. Australia 3. New Guinea 4. New Zealand.**

## 1945

**4D–140** 551.509.6 551.588.4

†*Australia. Meteorological Branch, **Bradfield scheme for watering the inland; meteorological aspects.** *Australia. Meteorological Branch, Bulletin,* No. 34, **1945.** 82 p. charts, tables, 22 appends. **DWB, NNA**—DR. BRADFIELD'S schemes for water conservation and irrigation in Queensland and Central Australia are discussed and largely discredited by members of a committee on the subject. Supporting papers are appended. (*Same item as* 2–163, Feb. 1950, *MAB.*) *Subject Headings:* **1. Climate control 2. Australia. I. Warren, H. N. II. Loewe, F. III. Foley, J. C. IV. Treloar, H. M.**

**4D–141** 551.5

†*§Australia. Royal Australian Air Force, **Weather on the Australia station.** v. 1 (not printed). v. 2. **Local information.** v. 3. **Aids to forecasting.** *Australia. Royal Australian Air Force, Publication,* No. 252, **1942–1945.** maps, charts, tables. Vol. 2 also listed as: *Australia. Meteorological Service, Research Reports, Ser. 4.* **DWB**—Vol. 2 consists of: Pt. 1, "Bismarck Archipelago" (58 p.); Pt. 2, "Northern Australian waters" (110 p.); Pt. 3, "The Coral Sea west from long. 155°E. including the coast of Papua and the Queensland coast from Cape York to Rockhampton" (147 p.); Pt. 4, "The Pacific Ocean from the Equator to the Tropic of Capricorn between longitudes 155° and 170°E." (75 p.); Pt. 5, "The Pacific Ocean between the Tropic of Capricorn and latitude 32°S., west of long. 170°E., including the Australian coast from Rockhampton to Port Macquarie" [n.p.]; Pt. 6, "The southeastern part of the Indian Ocean . . . including the coast of Western Australia from Esperance to Geraldton" (92 p.); Pt. 10, not printed. Pt. 11, "The eastern part of the Indian Ocean . . . including the coast of Western Australia from Condon to a point between Hamelin Pool and Geraldton" (70 p.); Pt. 12, "The eastern part of the Netherlands East Indies and the surrounding seas . . ." (122 p.). Each part contains a map of the area, various schematic diagrams, surface and upper wind roses, tables of climatic data for the usual elements and for upper winds at various stations in the region. Contents of text include chapters on general climatic and regional characteristics, cyclones, surface and upper winds, visibility, cloud, rain, temperature of sea and of air and their relative values, humidity, thunder, hail and snow, sea and swell, earth tremors, etc. A bibliography is included for each region (about 70 refs. in all). Vol. 3 consists of 3 parts of

which the first is not printed. Pt. 2, "Analyzed charts" (containing charts Ser. 4, 16–18), contains series of synoptic charts with discussion in text as follows: Ser. 4, describing a "willy willy" on the northwest coast of Australia, May 23–27, 1942 (tropical cyclone); Ser. 16, a series of morning and afternoon maps for the area Dutch New Guinea to Sumatra, including Northern Australia—March 17–22, 1941; Ser. 17, same for equatorial areas between New Guinea and Sumatra, including Northwestern Australia, April 21–26; Ser. 18, same, May 19–24. Pt. 3, "Analyzed charts" (Ser. 1–2) as follows: Ser. 1, tropical cyclone over the Timor Sea and the Northern Territory (March 6–16, 1937); Ser. 2, illustrating the formation of a tropical cyclone between Willis Island and the Solomon Islands and its passage westward to inland Queensland without recurve, Feb. 9–20, 1940. (Rest not printed yet—as of March 1953.) *Subject Headings:* **1. Climatology 2. Weather forecasting 3. Synoptic charts 4. Synoptic analysis 5. Tropical cyclones 6. Indonesia 7. Indonesian Seas 8. Australian coasts 9. Australian seas 10. Indian Ocean 11. Southwest Pacific Ocean.**

**4D–142** 551.515.8(94)

§Cassidy, M., **Frontology of sub-tropical Australia.** *Weather Development and Research Bulletin*, Melbourne, No. 1:5–28, April **1945.** 7 figs., 10 refs. Also **Frontal systems peculiar to the Australian continent.** *Ibid.*, No. 2:5–34, Oct. **1945.** charts, 10 refs. **DWB**—Contents of No. 1 include: discussion of analysis technique; Australian topography; air masses; conceptions of general circulation, anticyclones and frontal structure; discussion of chief weather types in winter, polar front, attending rain, the trades, etc., winter anticyclone; in spring the coastal front; and in summer diurnal oscillation of the polar front, minor coastal fronts, cyclones and the role of the sea-breeze in frontogenesis. In No. 2 author describes qualitatively the circulation of an air mass in its source region; he discusses the "monsoon" front exemplifying its seasonal nature and shows this front's relation to the system of coastal fronts and to the intertropical front. The popular exaggeration of large semi-permanent summer heat lows over the continent is shown to be fallacious from the point of view of circulation. Finally, the polar front and its unorthodox behavior are discussed. Synoptic examples for all these conditions are included. *Subject Headings:* **1. Fronts 2. Frontal analysis 3. Australia.**

**4D–143** 551.524.37

*§Foley, James C., **Frost in the Australian region.** *Australia. Meteorological Branch, Bulletin*, No. 32, **1945.** 142 p. charts, diagrs., fold. maps, numerous tables, 5 refs. **DWB, NNA**—Comprehensive study of frost in Australia is made: physical and meteorological conditions under which it develops, susceptibility of particular localities, the length of the frost season, problems of forecasting and methods of minimizing and preventing damage. Different sections are designed to be of value either to the technologists or to the farmer or other non-scientific reader for practical purposes. The four parts of the work deal with: 1) general principles of frost; 2) particular Australian conditions including weather situations with synoptic charts, critical temperatures, months of greatest risks for particular products, regional features, etc.; 3) appendices of extensive frost data, mostly from observations 1918–1943 in Australia and 4) short discussion of forecasting frost. Many illustrative and analytical data, charts, and diagrs. are included. (*Same item as* 3C–256, March 1953, *MAB.*) *Subject Headings:* **1. Frost 2. Frost forecasting 3. Frost protection 4. Australia.**

**4D–144** 551.524.2 551.571.2(94)

*Foley, James C., **A study of average hourly values of temperature, relative humidity and saturation deficit in the Australian region from records of Capital City Bureaux.** *Australia. Meteorological Branch, Bulletin*, No. 35, **1945.** 48 p. graphs, tables. **DWB, NNA**—The reliability as a standard of average 9 a.m. values of temperature, relative humidity and saturation deficit is judged by their degree of conformity (close) with the average of 24 hour means. Comparisons of temperature, humidity and saturation deficit values for various times during the day are made. Rates of change of the elements during the day are considered. Graphs of seasonal changes of time of occurrence of mean hourly temperature and saturation deficit are appended. Pt. 2 consists of tables of average hourly values of temperature and relative humidity at state capital cities. *Subject Headings:* **1. Temperature 2. Relative humidity 3. Saturation deficit 4. Australia.**

**4D–145** 551.553.11

*§Hounam, C. E., **The sea breeze at Perth.** *Weather Development and Research Bulletin*, Melbourne, No. 3:20–55, Nov. **1945.** 8 figs., 11 tables. **DWB**—In two parts: 1) theoretical aspects of the sea breeze, that is, its nature, origin, vertical extent, penetration inland, etc.; 2) analysis of the sea breeze at Perth Observatory with some data and schematic diagrams. *Subject Headings:* **1. Sea breezes 2. Perth, Western Australia.**

**4D–146** 551.509.3

Jones, P. H., **I predict a storm: a critical analysis of New Zealand conditions with an account of a new method of forecasting and its application to world climatology.** Gore, N. Z., Gore Publishing

Co., [1945] 79 p. 48 figs. append. **DLC, NNA**—Provocative popular articles on weather forecasting, stressing faults of professional and successes of amateur weather forecasters. The prediction diagram, which is really a correlation chart of temperature, moisture and weather conditions has been used in N. Z. for 20 years, by amateurs and schools. (*Same item as* 9–36, Sept. 1950, *MAB.*) *Subject Headings:* **1. Amateur forecasting 2. Elementary meteorology 3. New Zealand.**

**4D–147** 551.506.7(94)

*Loewe, Fritz, **Discussion of seven years of aerological observations obtained by means of aeroplanes near Sydney.** *Australia. Meteorological Branch, Bulletin*, No. 33, 1945. 47 p. 2 figs., 42 tables, 24 refs. **NNA**—Temperature and humidity observations from over 1900 meteorological flights at Richmond near Sydney, July 1937–Dec. 1943 are studied statistically. Conclusions are reached with regards to annual temperature variation (relatively small), vertical temperature lapse rates, temperature variability with altitude, correlations between simultaneous temperature deviations from the average at different levels, and relations with vertical stability, temperature inversions, humidity decrease with altitude, humidity lapse rate, vertical distribution of pressure and density, heat content of the air expressed by the pseudo-potential temperature, general similarity of upper air conditions up to 16,000 ft at Sydney with those already found at Melbourne. *Subject Headings:* **1. Upper air data 2. Sydney, New South Wales.**

**4D–148** 551.509.33

New Zealand. Meteorological Services, **Report on the extended range tropical forecasting project, Sept. 1944–Feb. 1945.** Wellington, 1945. 33+p. 31 figs., 2 tables, 14 refs., 7 eqs. **DWB**—An attempt to apply long-range forecasting methods developed by M. I. T. and U. S. Weather Bureau to tropical forecasting in the South Pacific region is described; attempt was unsuccessful owing to the obscurity of the relationships of tropical convection to the pressure systems discovered on the mean maps. Second part of report gives account of preliminary theoretical and analytical work carried out to discover relations between pressure systems and wind fields. Concluded that until further investigation, pressure systems cannot be related to short and long period changes in tropical weather. Maps include most of the Australia-New Zealand-Indonesia-South Pacific region. *Subject Headings:* **1. Tropical weather forecasting 2. Australia 3. New Zealand 4. Indonesia 5. South Pacific.**

**4D–149** 551.515.2(94)

§Rose, F. G. G., **A tropical cyclone in sub-tropical latitudes.** *Weather Development and Research Bulletin*, Melbourne, No. 2:35–57, 1945. 8 figs., table. Comments p. 59. **DWB**—Refers to March 14–15, 1943, when owing apparently to southerly movement of intertropical front the center of the tropical cyclone passed over southwest part of Western Australia. Exceptionally low pressure at Perth, etc., rain in 5 main bands, large amount of damage, speed approximately 90 mph. *Subject Headings:* **1. Tropical cyclones 2. Perth, Western Australia.**

**4D–150** 551.577.2:551.582.3(931)

*Seelye, C. J., **Maps of average rainfall in New Zealand.** Wellington, New Zealand, Meteorological Office, [1945]. [18 p.] entirely charts. **DWB**—Charts show isohyets of monthly and annual precipitation and average number of rainy days per year based on data for period from 1901–1930 (international "Normal Period") smoothed in the light of older records and shorter period records reduced to the 1901–1930 period. The charts are more detailed than those in "Köppen-Geiger" but for such rugged terrain cannot give the picture that would be obtained from the original data. Variations in average annual total range from <15 in. to <200 in. and from <2 in. to <20 in. in Dec. alone. (*Same item as* 4.1–180, Jan. 1953, *MAB.*) *Subject Headings:* **1. Rainfall distribution 2. Rainfall frequencies 3. Atlases 4. New Zealand. I. New Zealand. Meteorological Service.**—*M.R.*

**4D–151** 551.515.3(931)

Seelye, C. J., **Tornadoes in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B*, 27(2):166–174, Sept. 1945. 5 figs., 4 tables, ref. **NNA**—Between 9 and 25 tornadoes a year are experienced in New Zealand. Using 162 reports of tornadoes and waterspouts, author discusses their characteristics (small compared to American tornadoes), geographical distribution, annual and diurnal variations, associated weather types and damage of 8 of the most severe tornadoes. Tracks of 3 tornadoes are charted. (*Same item as* E–94, May 1950, *MAB.*) *Subject Headings:* **1. Tornadoes 2. New Zealand.**

**4D–152** 551.586:636

Trumble, H. C., **The relation of wet-season variability to fat-lamb production of South Australia.** *Royal Society of South Australia, Adelaide, Transactions and Proceedings*, 69(1):16–21, 1945.

figs., 4 tables, 4 refs. **DWB**—The wet season variability associated with fat-lamb production in Australia is analyzed on the basis of empirical relationships established between the mean length of the period of influential rainfall and the maximum expected occurrence of effective rainfall period. Maps show important areas for lamb raising. (*Same item as* 2.5–190, May 1951, *MAB.*) *Subject Headings:* **1. Agricultural climatology 2. Animal husbandry 3. South Australia.**

## 1946

**4D–153** 551.582:63(94)

*Australia. Meteorological Branch, **Meteorological summary for selected climatological stations, Australia, 1942–1945.** Melbourne, 1943–**1946.** 4 v. maps, tables. **DWB**—Series, issued monthly, includes reports on crops, stock, pastures, water supply, etc. throughout Australia as well as extensive climatic data and temperature and rainfall maps. *Subject Headings:* **1. Climatic data 2. Agricultural climatology 3. Australia.**

**4D–154** 551.577.37

§Edie, E. G., Seelye, C. J. and Raeside, J. D., **Notes on the Canterbury floods of Feb. 1945.** *New Zealand Journal of Science and Technology, Sec. B,* 27(5):406–420, March, **1946.** 12 figs., 2 refs. **NNA**—Synoptic conditions causing the heavy rains and floods are analyzed. Discussion of amount of rain, damage and especially of erosion are included. *Subject Headings:* **1. Rainfall extremes 2. Floods 3. Soil erosion 4. New Zealand.**

**4D–155** 551.585:551.582.1:551.573(931)

Garnier, Benjamin John, **Climates of New Zealand according to Thornthwaite's classification.** *Association of American Geographers, Annals,* 36(3):151–177, Sept. **1946.** Also revised in: **New Zealand weather and climate.** Christchurch, N. Z., Whitcomb and Tombs, **1950.** p. 84–104. graphs, tables, diagrs., 31 refs. **DLC**—Climatic classifications, types according to the Thornthwaite system T-E and P-E indices; correlations with vegetation and soil, local variations in types and, finally, detailed charts of the two main islands with supporting tabular data are presented and discussed. Based on THORNTHWAITE's 1931 system but somewhat revised after his 1943 paper. (*Same item as* 3.6–172, June 1952, *MAB.*) *Subject Headings:* **1. Climatic classification 2. Evapotranspiration 3. Precipitation effectiveness 4. Thermal efficiency 5. Thornthwaite's classification 6. New Zealand.**

**4D–156** 551.582(94, 931)

†Gentilli, Joseph, **Australian climates and resources.** Foreword by E. deCourcy Clarke. Perth, etc., Whitcombe & Tombs [**1946?**] 333 p. 98 figs., maps, 43 plates, refs. p. 299–307. **DWB, NNA**—Geography of Australia is discussed by appraising the value of the country to man. First, author describes position of Australia in relation to the rest of the world and then its broad geographical features. He further discusses industries, mining and quarrying which are dependent on structure and geology. Next he takes up climatic characteristics (which consists of about one third of the section on Australia), dealing with temperature, pressure, winds and rainfall. Appendix 1 shows how temperature and rain statistics are used to classify climates according to KÖPPEN. Soils, plant and animal life as influenced by climate are discussed, and it is shown how the primary industries of Australia are dependent on the natural features of geology, climate and soil. Human activities are taken up in the various climatic regions. The same system, less detailed, is followed in discussing New Zealand and New Guinea geography. Work is well illustrated by schematic maps and photographs. Bibliography is generally geographical. *Subject Headings:* **1. Climatology 2. Köppen's classification 3. Geography 4. Australia 5. New Zealand 6. New Guinea. I. Clarke, E. deCourcy.**

**4D–157** 551.577.2:63(94)

*Gentilli, Joseph, **Rainfall and climate in Western Australia and the rainfall wheat relationship.** Nedlands, W. A., **1946.** 37 p. tables, fold. maps., 15 refs. **MH-BH**—Rainfall statistics are given and discussed; correlations seen with wheat yield. (*Same item as* 9–114, Sept. 1950, *MAB.*) *Subject Headings:* **1. Rainfall distribution 2. Agricultural climatology 3. Wheat yields 4. Western Australia.**

**4D–158** 551.501 551.509

Gibbs, W. J., **Recent developments in weather analysis in Australia.** *Australian Geographer,* Sydney, 5(2/3):47–51, Nov. **1945**/June **1946.** 4 figs., 20 refs. **NNA**—Brief historical sketch of rapid progress of weather research in Australia in recent years, noting developments in extended forecasting, upper air, air mass, frontal and stream line analysis. *Subject Headings:* **1. Meteorological services 2. Synoptic analysis 3. Australia.**

4D–159 551.506(931):656.61

*Great Britain. Hydrographic Office, **New Zealand Pilot, comprising the coasts of the North and South Islands of New Zealand, Stewart Island and adjacent islands, Kermadec, Chatham, Bounty, Antipodes, Auckland and Campbell Island.** 11th ed. London, **1946.** 447 p. figs., tables, photos, fold. map. **DLC**—The section on meteorology (p. 25–59) discusses various weather elements, i.e., depressions, winds, cyclonic disturbances and visibility for the area as a whole as well as the local weather (wind, temperature, humidity, cloud and rainfall) for 8 more restricted areas. Tabular data of usual elements are given for 12 stations with their geographic coordinates and period of record. Average rainfall for Auckland and Dunedin is based on 88 years' observations. *Subject Headings:* **1. Pilot guides 2. Observational data 3. New Zealand.**—*M.L.R.*

4D–160 551.509.33

Mackey, G. W. and Dale, P. T., **Zonal indices—notes on their use in Tasmania.** *Weather Development and Research Bulletin*, Melbourne, 6:15–20, **1946.** fold. chart, tables. **DWB**—Zonal indices, daily and five-day, were calculated south of anticyclone track across Australia Aug. 1945–March 1946. (*Same item as* 2A–134, Jan. 1951, *MAB.*) *Subject Headings:* **1. Zonal index 2. Extended forecasting 3. Tasmania 4. Australia.**

4D–161 551.582:629.13

§Newman, B. W. and McCann, A., **Weather conditions affecting aviation over the Tasman Sea. Part 4. Flying conditions over the Tasman Sea.** *Australia. Meteorological Branch, Bulletin*, No. 36, **1946.** 20+p. 19 figs., 3 tables. **DWB**—This work forms a supplement to the statistical survey (published 1938 as *Bulletin* No. 24, . . . No. 25) and is more a preliminary review of actual results than a treatise on dynamical meteorology of the Tasman Sea. Work is based on flights of 2 flying boats on the Auckland-Sydney air route since May 1940 and treats particularly cases of diverse flying conditions and statistical information for comparison with earlier surveys. General discussions of cloud distribution, movement and behavior of fronts, cyclones or deep depressions, stream weather, air masses, turbulence, icing, freezing level and thunderstorms are included as well as statistical data and comparisons (in 3 summary tables) and finally 19 selected synoptic charts. *Subject Headings:* **1. Aeronautical climatology 2. Auckland-Sydney air route 3. Tasman Sea.**

4D–162 551.506.7(94)

*Radok, Uwe, **Discussion of four years of aerological observations obtained by means of aeroplanes near Perth.** *Australia. Meteorological Branch, Bulletin*, No. 37, **1946.** 22 p. 3 figs., 40 tables, 4 refs. **NNA**—Temperature and humidity observations obtained from approximately 1300 meteorological flights at Pearce, near Perth, Australia, Nov. 1938–1944, are examined statistically. Conclusions are drawn with regards to: annual and seasonal temperature variations, vertical temperature lapse rates, correlations in temperature deviations from average and between interdiurnal changes at different levels, temperature inversions, vertical distribution of relative humidity, etc. *Subject Headings:* **1. Upper air data 2. Perth, Western Australia.**

4D–163 551.577.3(931):551.582.3

Seelye, C. J., **Maps of extreme monthly rainfall in New Zealand.** Wellington, New Zealand, Meteorological Office, May **1946.** [18 p.] all charts. **DWB**—Detailed zipatone charts of New Zealand show frequency of monthly total rainfall below 1 in. or above 6 in. for each of four seasons, and actual maximum and minimum monthly rainfall for each of these seasons for the period 1911–1940. Isopleths were drawn on the basis of records of 134 stations for 30 years, and of 192 stations with shorter periods or with a different period of record. (*Same item as* 3.6–161, June 1952, *MAB.*) *Subject Headings:* **1. Rainfall charts 2. Rainfall extremes 3. New Zealand. I. New Zealand. Meteorological Service.**—*M.R.*

4D–164 551.577.3

Seelye, C. J., **Variations of monthly rainfall in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B*, 27(5):397–405, March **1946.** 2 figs., 6 tables, 6 refs. **NNA**—Using 30 year records, 1911–1940, percentage variations of rainfall for a particular month from year to year in New Zealand as a whole and in its different regions are determined. Isohyets and a schematic diagram of frequency distribution of rainfall for 1000 months with several mean variabilities are drawn; tabulated calculations included. *Subject Headings:* **1. Precipitation variations 2. New Zealand.**

4D–165 551.582:629.13

*Stafford, R. L., **Meteorological report on the Ceylon to West Australia air route.** *Great Britain. Meteorological Office, Aviation Meteorological Report*, No. 32, **1946.** 36 p. 13 figs., tables. **DWB**—Description of weather on this airway is based on reports of "Quantas Airways" captains who made

detailed and regular observations each hour for over a year. Climatic tables and diagrammatic analysis of poor visibility based on weather reports by ships are included as well as schematic drawings of cloud and wind conditions. *Subject Headings:* **1. Airways climatic data 2. Ceylon-Western Australia air route.**

## 1947

**4D–166** 551.501.8 551.594.7

*Alexander, F. E. S., **Observations of unorthodox radar vision in the vicinity of New Zealand and Norfolk Island.** (In: **Meteorological factors in radio-wave propagation.** London, Physical Society, **1947.** p. 242–249. 3 figs., 3 tables.) **DWB**—Unorthodox radar vision is largely associated with "föhn" in the southern part and with slow moving anticyclones in the northern part of New Zealand. Tables present number of days when unorthodox vision was recorded. (*Same item as* 2H–61, Aug. 1951, *MAB*). *Subject Headings:* **1. Radar storm detection 2. Radar echoes 3. New Zealand.**

**4D–167** 551.509.318

§Australia. Meteorological Branch, **A series of Australian synoptic situations.** *Australia. Meteorological Branch, Monthly Note,* AMFA M. 68. [1947] Also: *U. S. Office of Naval Operations, NAVAER* 50-1R-205. 12 p. 31 figs. **DWB**—Synoptic situations in Australia, Jan. 1947, are described and illustrated on small charts for the following conditions: intense hailstorm at Sydney, tropical storm off NE Australia, complicated situation off Cape Leeuwin, anticyclone over New Zealand and its influence on east Australian weather. *Subject Headings:* **1. Synoptic studies 2. Hail 3. Tropical cyclones 4. Anticyclones 5. Australia 6. New Zealand.**

**4D–168** 551.524.2:551.577.2

Bondy, F. and Seelye, C. J., **Temperatures associated with rainfall in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B,* 28(4):253–528, Jan. **1947.** 3 figs., table. **NNA**—Lower temperatures on wet days in various regions of N. Z. during different seasons are discussed, and reasons for differences: accompanying weather conditions, location, etc., pointed out. *Subject Headings:* **1. Precipitation 2. Temperature 3. New Zealand.**

**4D–169** 551.506.3 551.582.2(94, 931)

*Clayton, Henry Helm (*ed.*), **World weather records.** *Smithsonian Miscellaneous Collections,* vs. 79, 90 and 105, **1927–1947.** chiefly tables. **DLC**—An alphabetical arrangement has been followed in presenting the data—first by large areas, then by country within the area and, finally, by station for each country. Australia is one of the large areas, but New Zealand will be found under South Pacific. Tables cover from beginning of record to 1940. Coordinates and altitude are given for 5 stations in Australia and 5 in New Zealand. (*Same item as* 3C–6, March 1952, *MAB.*) *Subject Headings:* **1. Climatic data 2. World weather records 3. Australia 4. New Zealand.**—*M.L.R.*

**4D–170** 551.5(931):016

†Dacre, J. C., **Climatology and meteorology of the New Zealand area: a bibliography.** *New Zealand Geographer,* 3(2):129–136, Oct. **1947.** entirely refs. Reprinted with slight additions in: Garnier, B. J. (*ed.*), **New Zealand weather and climate.** Christchurch, N. Z., Whitcomb and Tombs, **1950.** Appendix 1, p. 141–147. **DLC, NNA**—Author indicates to climatologists, meteorologists, geologists, to those concerned with forest conservation and management, to soil conservators, etc., where weather data, monthly and yearly climatic summaries and notes may be found. Publications are listed under the following main headings: those of the Meteorological Office, Wellington; those in the New Zealand Journal of Science and Technology; those in the New Zealand Institute, Transactions; those in the New Zealand Journal of Agriculture; and others such as geological bulletins, New Zealand official gazettes and yearbooks, and miscellaneous publications. This good, but not extensive, little-annotated bibliography contains some references of less significance or of primarily geologic interest not included in the present bibliography. (*Same item as* 3.5–256, May 1952, *MAB.*) *Subject Headings:* **1. Bibliographies 2. Climate of New Zealand 3. Geology 4. New Zealand.**

**4D–171** 551.582(94)

Farmer, Joan N., **Studies in the environment of Queensland. 1. The climatology of semi-arid pastoral areas.** *Queensland Journal of Agricultural Science,* 4(3), **1947.** Also: *Queensland. Dept. of Agriculture and Stock, Plant Industry Bulletin,* No. 36 and *Animal Industry Bulletin,* No. 1, Sept. **1947.** 39 p. 19 figs., 4 tables, 24 refs. **NNA**—Literature dealing with climatic classification is reviewed. The P/E ratio is used as a method of measuring effective rainfall in Australia. Seasonal incidence of effective rainfall is calculated for bi-monthly periods, and zonation is undertaken on the basis of its reliability. Summer and winter P/E differences, mean minimum winter and mean

maximum summer temperatures are considered, and the broad influence of climatic factors on growth and distribution of plants and on sheep husbandry in Australia is discussed. *Subject Headings:* **1. Climatology 2. Agricultural climatology 3. Precipitation-evaporation ratio 4. Queensland, Australia 5. Australia.**—*Author's abstract.*

**4D–172** 551.5:632.187 551.509.39

†*§Foley, James C., **A study of meteorological conditions associated with bush and grass fires and fire protection strategy in Australia.** *Australia. Meteorological Branch, Bulletin*, No. 38, 1947. 234 p. 16 figs., charts, numerous tables, 104 refs. **DWB**—Detailed and extensive study of bush fires in Australia and information concerning weather factors important to their occurrence, spread and prevention. (*Same item as* 6–24, June 1950, *MAB.*) *Subject Headings:* **1. Fire weather forecasting 2. Australia.**

**4D–173** 551.509.31

Gabites, J. F., **Weather forecasting today.** *New Zealand Meteorological Office, Meteorological Office Note*, No. 32, 1947. *Royal Society of New Zealand, Transactions*, 77(5):60–65, Nov. 1949. **DLC**—A short summary of forecasting methods recently developed all over the world and their application to the region northeast from Australia and New Zealand. Upper air network in the South Pacific decreased from over 30 radiosonde stations to 12 since the war. Two radar wind stations are in operation. New Zealand meteorologists experimented with stream-flow analysis, estimating horizontal divergence. Sample maps for stream flow and divergence field are given. (*Same item as* 2.5–35, May 1951, *MAB.*) *Subject Headings:* **1. Weather forecasting 2. Divergence analysis 3. New Zealand 4. South Pacific.**—*A.A.*

**4D–174** 551.515.23:551.509.39:550.34(94)

Jones, O. A., **The detection and tracking of cyclones off the Queensland coast.** *Australian Journal of Science*, 10(2):43–44, Oct. 1947. refs. **DLC**—Summary of work done in U.S.A. in tracking hurricanes by microseisms, and suggestion that a network of seismic stations established near Queensland (on islands and mainland) would improve storm warning and synoptic forecasting service at little cost. An early analysis of microseism records during a cyclonic storm was made by BRIAN and RICK at University of Queensland in 1938. *Subject Headings:* **1. Microseismic storm detection 2. Cyclone tracks 3. Storm warning services 4. Seismic stations 5. Queensland, Australia.**—*M.R.*

**4D–175** 551.506.7:551.547(931)

*Kerr, I. S., **Mean values of heights of tropopause, 300, 500, and 700 millibar surfaces at Auckland, Hokita and Taieri.** *New Zealand. Meteorological Office, Circular Notes*, No. 43, [1947]. 5 p. fig., 2 tables. **DWB**—Monthly means of the height of the tropopause and of the 300, 500 and 700 mb surfaces are computed from radiosonde data from Auckland (1943–1947), Hokitika (1944–1945) and Taieri (1944–1945). *Subject Headings:* **1. Tropopause height 2. New Zealand.**

**4D–176** 551.578.71 551.515.4(94)

*Newman, B. W., **Phenomenal hailstorm with thunderstorm, Sydney, 1st Jan. 1947.** *Weather Development and Research Bulletin*, Melbourne, No. 8:23–38, July 1947. 7 figs., 2 refs. **DWB**—Path of storm outlined, detailed description of meteorological conditions given with data. (*Same item as* D–54, April 1950, *MAB.*) *Subject Headings:* **1. Hailstorms 2. Thunderstorms 3. Sydney, New South Wales.**—*M.L.R.*

**4D–177** 551.577.36/7

*Seelye, C. J., **The frequency of heavy daily rainfalls in New Zealand.** *New Zealand. Meteorological Office, Meteorological Office Note*, No. 33, [1947]. Also: *Royal Society of New Zealand, Transactions and Proceedings*, 77(5):66–70, Nov. 1949. 2 maps, tables, 3 refs., eqs. **DLC**—Statistical analysis of rainfall data from 37 stations with 30 to over 90 years of record, to show the greatest daily rainfall likely to occur in 1 year, 10 years or 100 years at each place. Method for determining frequency of daily rainfall amount tested and found reasonably accurate. (*Same item as* 9–118, Sept. 1950 and 2.5–152, May 1951, *MAB.*) *Subject Headings:* **1. Precipitation frequencies 2. Precipitation extremes 3. New Zealand.**

**4D–178** 551.577.36(931)

*Seelye, C. J., **Rainfall intensities at Wellington, N. Z.** *New Zealand Institution of Engineers, Proceedings*, 33:452–466, 1947. 3 figs., 12 tables, 4 refs., 17 eqs. Abstracted from reprint. **MH-BH**—Statistical methods are applied to data from 81 year rainfall record and autographic records for

18 years to show depth duration frequencies of hourly, daily and 3-day rainfall averages and extremes. (*Same item as* 9–117, Sept. 1950, *MAB.*) *Subject Headings:* **1. Rain intensities 2. Rainfall depth duration frequencies 3. Wellington, New Zealand.**—*M.R.*

**4D–179** 551.524:551.577(931)

Seelye, C. J. and Bondy, F., **Temperatures associated with rainfall in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B,* 28(4):253–258, **1947.** Also: *New Zealand. Meteorological Office, Meteorological Office Note,* No. 31, **1947.** 6 p. table, 3 charts. **DWB**—Ten year temperature data for wet days from 23 stations distributed over New Zealand are presented and analyzed. It is found that temperature associated with rain is about 2°F lower near the east coast than near the west coast in winter, while no significant difference appears in summer. Departure of mean for wet days from general daily mean is presented in charts. (*Same item as* 3.8–110, Aug. 1952, *MAB.*) *Subject Headings:* **1. Temperature-precipitation relations 2. New Zealand.**—*G.T.*

**4D–180** 551.515.8(94)

Warren, H. N., **Wartime activities of the Australian Meteorological Service (R.A.A.F.).** *American Meteorological Society, Bulletin,* 28(2):69–72, Feb. **1947.** 2 figs. **DWB**—History and development of frontal analysis in Australia are described, especially as augmented by R.A.A.F. work in aviation forecasting during the war. Advances are summarized. *Subject Headings:* **1. Frontal analysis 2. Australia.**

**4D–181** 551.509.31:551.515(931)

Watts, Ian E. M., **Forecasting New Zealand weather.** *New Zealand Geographer,* 1(2):119–138, Oct. **1945.** 16 figs. Also: **The relations of New Zealand weather and climate: an analysis of the westerlies.** *Ibid.,* 3(2):115–129, Oct. **1947.** 16 figs., 2 tables, 4 refs. **NNA**—1) Well illustrated informative paper in which author stresses the influence of sharp topographic contrasts on local weather and climate in N. Z. and points out that general forecasting principles may do for the region as a whole, but they are insufficient alone for accurate local forecasting. Frontal deformation, wave depressions, wave formation and wave series are discussed. An ingenious series of photographs of models showing topography, synoptic types, and associated cloud conditions is included. (Reprinted in: "New Zealand weather and climate." B. J. Garnier (*ed.*). 1950. p. 6–44.) (*Same item as* 3.5–80, May 1952, *MAB.*) 2) The author follows up his first paper with an analysis of the westerlies in relation to the sharply contrasted variety of New Zealand's regional climates. Numerous small climatic charts and more cloud models for various synoptic types included. *Subject Headings:* **1. Synoptic forecasting 2. Topographic effects 3. Air masses 4. Clouds 5. New Zealand.**

## 1948

**4D–182** 551.582.2(94)

*Australia. Meteorological Branch, **Results of rainfall observations made in . . .** Melbourne, **1840–1948.** maps, diagrs., extensive tables. Titles vary. **DWB**—Results of observations made in different states of Australia: New South Wales, 1903–1908 and 1909–1914 to end of 1940; South Australia and the Northern Territory, 1860–1917; Western Australia, 1876–1927; Tasmania, 1835–1934; Victoria, 1840–1910 and 1911–1936; Queensland, Papua and New Guinea, etc., 1865–1913 and 1914–1938. Most issues contain all available rainfall values for a particular state for the period involved, as well as maps and schematic diagrams, discussions especially in relation to industries, and tables of other climatic data for selected stations. *Subject Headings:* **1. Precipitation 2. Precipitation data 3. Climatic data 4. Victoria, Australia 5. Western Australia 6. Queensland 7. New South Wales 8. South Australia 9 Tasmania 10. New Guinea 11. Solomon Islands 12. New Hebrides. I. Hunt, Henry A. II. Jones, Inigo.**

**4D–183** 551.578.7

Dwyer, W. N. and McIntyre, D. G., **Hailstorm at Charleville, Queensland on 23rd November, 1947.** *Weather Development and Research Bulletin,* Melbourne, No. 10:21–22, June **1948.** 2 photos, chart. **DWB**—Covers synoptic situation, upper air conditions, formation of storm, area of storm and damage. (*Same item as* D–136, April 1950, *MAB.*) *Subject Headings:* **1. Hailstorms 2. Charleville, Queensland.**—*M.L.R.*

**4D–184** 551.585:631.95

Gentilli, Joseph, **Climatic regions; a review of Koeppen's and Thornthwaite's systems as applied to Australia.** Nedlands, **1946.** 17 p. 2 fold. maps, 43 refs. Mimeographed. **NNA.** Also: **Two climatic systems applied to Australia.** *Australian Journal of Science,* 11(1):13–16, Aug. **1948.** 2 figs., refs. **DLC**—The two systems are discussed and applied to Australia. Separate maps show climatic regions according to each. *Subject Headings:* **1. Climatic classifications 2. Australia.**

4D–185 551.582:629.13

*§Hogan, J., **Meteorology of the Indian Ocean area between Australia and India.** *Australia. Meteorological Branch, Bulletin*, No. 40, 1948. 88 p. 25 figs., tables p. 66–88. **NNA**—Information gained during war years in forecasting for the Perth-Colombo air route is presented. Meteorological conditions are discussed by months for the area north of and south of Cocos Island so that northeast and southwest monsoons can be treated as separate entities and hemispheric differences can be noted. Following these monthly discussions of weather and wind (including upper air), representative synoptic charts are given and, finally, tables of seasonal and upper wind direction and speeds in 12 zones along the route. *Subject Headings:* **1. Airways climatic data 2. Aeronautical climatology 3. Upper air winds 4. Perth-Colombo air route 5. Indian Ocean.**

4D–186 551.594.6

Kerr, J. F., **Radio superrefraction in the coastal regions of Australia.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 1(4):443–463, Dec. 1948. 14 figs., 9 refs. **MH-BH**—A study of geographical and meteorological factors affecting superrefraction of radio or radar echoes in and near Australia, based on reports from 112 R.A.A.F. radar warning stations, 1944–1945. (*Same item as* 2.3–173, March 1951, *MAB.*) *Subject Headings:* **1. Radar echoes 2. Anomalous radio propagation 3. Australia.**

4D–187 551.577.3:551.501.4

Loewe, Fritz and Radok, Uwe, **Variability and periodicity of meteorological elements in the Southern Hemisphere with particular reference to Australia.** *Australia. Meteorological Branch, Bulletin*, No. 39, 1948. 49 p. **NNA**—Work consists of three articles: 1) F. Loewe, "Some considerations regarding the variability of annual rainfall in Australia" (p. 1–13, 8 figs., 5 tables, 27 refs.).—Charts show average and extreme rainfall variability indexes for Australia for 1913–1937, 1888–1937, and for 25 years around 1900 and 1925. Data given for each station, methods explained (*same item as* 6–71, June 1950, *MAB*). 2) Uwe Radok, "On the nature of variations in Queensland rainfall" (p. 15–35, 18 figs., 11 tables, 43 refs., append.). Detailed statistical study of monthly and annual rainfall data for Queensland. Charts and graph show processes used. An appendix on punch card operations is added. (*Same item as* 6–71, June 1950, *MAB.*) 3) F. Loewe, "A contribution to the study of the variability of meteorological elements in the subtropical and temperate latitudes of the Southern Hemisphere" (p. 37–49). Variability in temperature, humidity, cloudiness and sunshine in the Southern and Northern Hemispheres are contrasted using examples from Australian sources. A global pattern of variability of these elements with differences resulting from land and sea distribution is indicated. Particular influence of this pattern in the Australian region is emphasized. *Subject Headings:* **1. Rainfall variations 2. Statistical studies 3. Correlations 4. Climatic variations 5. Queensland, Australia 6. Australia 7. Southern Hemisphere.**

4D–188 551.578.7

§Milthorpe, W., **An account of the severe hailstorm at Charleville, Queensland on 23rd Nov., 1947.** *Weather Development and Research Bulletin*, No. 10:21–22, June 1948. 2 photos, chart. **DWB**—Covers synoptic situation, upper air conditions, formation of storm, area of storm and damage. (*Same item as* D–135, April 1950, *MAB.*) *Subject Headings:* **1. Hailstorms 2. Australia.**—*M.L.R.*

4D–189 551.521.11:697:551.501.4(94)

Phillips, R. D., **Sunshine and shade in Australasia.** *Australia. Commonwealth Experimental Building Station, Sydney, Duplicated Document*, No. 23, May 1948. 32 p. photos, graphs, diagrs., protractor in pocket. Price: 1 s. **DWB**—Nomograms, tables and a protractor are included for calculating the angles at which the sun's rays will fall on buildings at different latitudes, seasons and times of day. Detailed explanations are given and charts show comparative mean temperatures for each day of the year at several Australian stations. (*Same item as* 3.7–116, March 1952, *MAB.*) *Subject Headings:* **1. Solar angles 2. Building design 3. Sunshine data 4. Australia.**—*M.R.*

4D–190 551.586:631(94)

Prescott, J. A., **The response of the growth of pastures to temperature.** *Australian Journal of Science*, 11(1):24–25, Aug. 1948. fig., table, 2 refs. **DLC**—As a test of Van't Hoff's law of change in speed of growth with rise in temperature, data and regression curve are presented for growth of pasture versus mean temperature, given adequate moisture supply. All correlation coefficients significant at 1% level or better. Data used are for Woods Point, South Australia (rye, grass and clover), and South Johnstone, North Queensland (tropical grasses). (*Same item as* 3.5–267, May 1952, *MAB.*) *Subject Headings:* **1. Agricultural meteorology 2. Thermal efficiency 3. Forage crops 4. Van't Hoff's law 5. Australia.**—*M.R.*

4D–191 551.583.2

Raeside, J. D., **Some post-glacial climatic changes in Canterbury and their effect on soil formation.** *Royal Society of New Zealand, Transactions*, 77, Pt. 1:153–171, April **1948.** 2 figs., 4 diagrs., 30 refs. **NNA**—Anomalies between vegetation and soils, and present-day climates are discussed in their application to the problem of climatic change. Evidence bearing on climatic changes and nature and dating of these changes are discussed. *Subject Headings:* **1. Climatic changes 2. Soil types 3. Canterbury, New Zealand.**

4D–192 551.586(02):599

Taylor, Thomas Griffith, **Australia; a study of warm environments and their effect on British settlement.** 5th ed. London, Methuen; New York, Dutton, **1948.** 455 p. 142 figs., tables, refs. **DLC**—A large, general text on the geography, including climatic conditions and manifestations, of Australia (designed for use in universities and high schools), in which data are expressed graphically whenever possible. Climate is dealt with on p. 51–75. The rest of the work has broad geographical scope. A small section on New Zealand geography is also included. *Subject Headings:* **1. Climatology 2. Geography 3. Human activity 4. Textbooks 5. Australia 6. New Zealand.**

## 1949

4D–193 551.558.2(946)

Desmond, E. and Radok, Uwe, **Note on vertical air currents on the Tasmanian air route.** *Weather Development and Research Bulletin, Melbourne*, No. 13:5–15, July **1949.** fig., 4 charts, table, 8 refs. **DWB**—Large areas of rising and descending air are reported between Tunbridge and 40°S lat. Theories are proposed. Suggested that there may be waves caused by a temperature inversion in conjunction with a pressure trough over the escarpment of the Central Tasmanian Plateau. *Subject Headings:* **1. Vertical currents 2. Temperature inversions 3. Tasmania.**

4D–194 551.582(94)

*Gentilli, Joseph, **The climate of Perth, W. A.** *Scope*, Perth, 1(4):60–62, **1949.** 7 tables. Abstracted from reprint. **MH-BH**—Climatic summary for Perth and for four similarly situated places in other continents with tables of mean and extreme temperature, rainfall and raindays. (*Same item as* 2.7–157, July 1951, *MAB.*) *Subject Headings:* **1. Climatology 2. Climatic data 3. Perth, Western Australia.**—*C.E.P.B.*

4D–195 551.509.31

*§Gibbs, W. J., **A period of analysis for the Southern Ocean and its implication in Southern Hemisphere circulation.** *Weather Development and Research Bulletin*, Melbourne, No. 12:5–42, **1949.** 11 figs., 6 charts, 7 tables, 4 refs. **DWB**—Synoptic analysis for the region 30–70°S and 30–170°E for Aug.–Nov. 1948, using frequency diagrams and tables for about 2,000 surface observations from Heard Island and 1500 from Macquarie in addition to about 150 radiosonde ascents from each station. Frequency data given for pressure, temperature, wind speed and direction and upper temperatures. Charts present the occurrence of depressions and a few weather situations are shown as a sample. *Subject Headings:* **1. Synoptic analysis 2. Frequency data 3. Heard Island 4. Macquarie Islands 5. South Pacific 6. South Indian Ocean.**—*A.A.*

4D–196 551.524.37

Mackey, G. W. and Mason, B., **Investigation of frost liability of new land before opening for settlement.** *Weather Development and Research Bulletin*, Melbourne, No. 12:57–68, March **1949.** **DWB**—Results of an investigation by the South Australian Dept. of Agriculture to determine frost possibilities of new land in the Murray Valley at Loxton before settlement and agricultural development are summarized. A frost probability contour map is included. Comparison made of the new site with Berri sites. *Subject Headings:* **1. Frost frequencies 2. Loxton, South Australia 3. Berri, South Australia.**

4D–197 551.506.1:551.582.3(94)

*Netherlands. (K.) Meteorologisch Instituut, **Zeegebieden rond Australië; oceanografische en meteorologische gegevens.** [Sea areas around Australia; oceanographic and meteorological data.] *Netherlands. (K.) Meteorologisch Instituut, [Uitgave]*, No. 124, **1949.** 96 p. Price: F20. **MH-BH, DWB**—Large, detailed charts contain isolines or statistical data for meteorological elements based on many thousands of ships' observations since 1854. (*Same item as* 2.1–24, Jan. 1951, *MAB.*) *Subject Headings:* **1. Marine atlases 2. Observational data 3. Southwest Pacific 4. Australian seas.**

4D–198 551.509.31:551.577.37

§Phillpot, H., **A study of the synoptic situation over Australia for the period 12th–19th June, 1948, including the development of flood rains in northeastern New South Wales.** *Weather Development and Research Bulletin*, Melbourne, No. 13:24–36, July **1949.** 33 figs. **DWB**—A detailed study of the data vailable for this period is made with synoptic charts. *Subject Headings:* **1. Synoptic studies 2. Excessive rainfall 3. New South Wales.**

4D–199 551.577:631

Prescott, J. A. and Thomas, Joyce A., **The length of the growing season in Australia as determined by the effectiveness of the rainfall.** *Royal Geographical Society of Australasia, South Australian Branch, Proceedings*, 50:42–46, **1948/1949.** map, 2 tables. **NNA**—Map of Australia and table show average number of months with values of moisture index P/s.d.[75] equal to or in excess of certain values (4, 8, 12, 16 and 20). Variability in effective rainfall is not considered. Brief discussion. (*Same item as* 2.9–150, Feb. 1951, *MAB.*) *Subject Headings:* **1. Precipitation effectiveness 2. Agricultural climatology 3. Soil moisture 4. Australia.**

4D–200 551.558.1:551.515.4(94)

Radok, Uwe, **A remarkable thunderstorm flight record.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 2(4):550–563, Dec. **1949.** 8 figs., table, 6 refs. **MH-BH**—Records of downdrafts of 130 ft/sec in a thunderstorm at Benalla, Victoria are reproduced and meteorological and aerological conditions discussed in detail. Concluded that conditions in Australia are not identical with those in Florida. (*Same item as* 2.2–103, Feb. 1951, *MAB.*) *Subject Headings:* **1. Vertical velocity 2. Thunderstorm dynamics 3. Benalla, Victoria.**

4D–201 551.509.67(94)

Roy, A. K., **Rain-making experiments in Australia: experimental control on the yield of rain from clouds.** *Science and Culture*, 14(5):173–178, Nov. **1948.** 8 figs., 3 tables. Also: Smith, E. J., **Experiments in seeding cumuliform cloud layers with dry ice.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 2(1):78–91, March **1949.** 7 figs., 14 plates, table, refs. And: Squires, P. and Smith, E. J., **The artificial stimulation of precipitation by means of dry ice.** *Ibid.*, 2(2):232–245, **1949.** 2 figs., 2 tables, 6 refs. **DLC**—1) Experiments in cloud seeding with dry ice over Australia discussed, with cloud photos, description of methods, and reiteration of theories. 2) Five Australian experiments of dropping dry ice into supercooled clouds with resulting precipitation described and illustrated. (*Same item as* C–189, March 1950, *MAB.*) 3) Dry ice seeding experiments near Sydney in supercooled clouds with positive results are described. (*Same item as* C–190, March 1950, *MAB.*) *Subject Headings:* **1. Cloud seeding 2. Australia. I. Smith, E. J. II. Squires, P.**

4D–202 551.582(94)

Wood, C. A., **Australian weather.** *Weather*, 4(2):54–61, Feb. **1949.** 6 figs., photos. **DWB**—Popular description of general features of Australian weather. *Subject Headings:* **1. Weather 2. Australia.**

## 1950

4D–203 551.582:628.8(931)

Bastings, L. and Simmons, Pamela E., **Climatic zones and domestic heating in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B*, 32(3):44–53, Nov. **1950.** 5 tables, 10 refs. **DWB, NNA**—Temperature data for New Zealand are analyzed on the degree-day principle, and five climatic zones determined, from which estimates of necessary fuel allocation can be inferred. Some brief comparisons with degree days in other places in the United Kingdom and the United States are made. *Subject Headings:* **1. Climatic zones 2. Heating and ventilating 3. New Zealand.**

4D–204 551.577.38(931)

Bondy, F., **Droughts in New Zealand.** *New Zealand Journal of Science and Technology, Sec. B*, 32(2):1–10, Sept. **1950.** 4 figs., 3 tables, graphs, 9 refs. Also: *New Zealand. Meteorological Office, Meteorological Office Note*, No. 34. **DWB, NNA**—Occurrence of absolute and partial droughts in N. Z. are discussed: their frequency according to duration, geographical and seasonal distribution, chronological notes on occurrence of major droughts, and year-to-year variation of partial droughts and sunspot figures. (*Same item as* 3.11–204, Nov. 1952, *MAB.*) *Subject Headings:* **1. Drought 2. New Zealand.**

4D–205 551.582(94)

Chidlow, Teresa A., **Geography and development of land utilization in Seabrook, Western Australia.** *Western Australia. University. Geographical Laboratory, Research Report*, No. 15,

May **1950.** 8 p. **MH-BH**—Climate of Seabrook is briefly described (Mediterranean type) with notes on frosts, soil and vegetation. (*Same item as* No. 2.8–133, Aug. 1951, *MAB.*) *Subject Headings:* **1. Climatology 2. Seabrook, Western Australia.**—*C.E.P.B.*

4D–206 551.582.2(931)

***Climatic data for forty stations in New Zealand.** (In: Garnier, B. J. (*ed.*), **New Zealand weather and climate.** Christchurch, New Zealand, Whitcomb and Tombs, **1950.** p. 149–152. tables.) **DLC**—Includes mean monthly and annual temperature, precipitation, P-E and T-E for 40 stations, with their coordinates and length of record. (*Same item as* 3.6–159, June 1952, *MAB.*) *Subject Headings:* **1. Climatic data 2. New Zealand.**—*M.R.*

4D–207 551.58:728

Drysdale, J. W., **Climate and house design.** *Australia. Experimental Building Station, Sydney, Duplicated Document,* Nos. 21, 23, 27, 30, 32, 33, **1947–1950.** Titles and subtitles vary; paging varies. figs., tables. **DWB**—An Australian study of problems of building design in relation to climate. Some of the papers review investigations of each year; some deal with particular aspects such as "Sunshine and shade in Australasia" (No. 23) by R. O. Phillips; physiological studies, effects of summer conditions on human beings (No. 32, *see item* 3G–224, July 1952, *MAB*); thermal characteristics of structures (No. 21, *see item* 3G–202, July 1952, *MAB*), etc. *Subject Headings:* **1. Applied climatology 2. Building design 3. Human activity 4. Australia. I. Phillips, R. O.**

4D–208 551.582:016(931)

†Garnier, Benjamin John (*ed.*), **New Zealand weather and climate.** Christchurch, N. Z., Whitcomb and Tombs, **1950.** 154 p. tables, graphs, diagrs., charts, bibliog. p. 141–147. *New Zealand Geographical Society, Miscellaneous Series,* No. 1, **1950. DLC**—The first of a series of publications which the New Zealand Geographical Society inaugurated in order to collect many scattered articles on the climate and geography of New Zealand. Included are articles by N. G. Robertson, "Organization and development of weather observations in New Zealand" (*see* 4D–223 below); E. M. Watts, "Forecasting New Zealand weather" (*see* 4D–181 above). Also Edward Kidson, "The elements of New Zealand's climate"—A concise but complete coverage of the main elements in the climate of New Zealand, amply supported by data and charts or graphs of various types. Chapters include those on weather regimes; prevailing winds and frequencies; effect of wind on flora and fauna; precipitation, including variability in time and space, and its influence on plants and animals; same for temperature, snowfall, frost, hail, thunderstorms and fog. B. J. Garnier, "Climates of New Zealand according to Thornthwaite's classification" (*see item* 4D–155 above) and "The seasonal climates of New Zealand" (*see item* 4D–209 below). In addition, a list of 142 publications on New Zealand climate, classified according to source, and basic climatic data for 40 stations in New Zealand (monthly and annual temperature, precipitation, P-E and T-E) are included. (*Same item as* 3.6–155, June 1952, *MAB.*) *Subject Headings:* **1. Climatology 2. Climatic data 3. Bibliographies 4. Climate of New Zealand 5. New Zealand. I. Kidson, Edward. II. Robertson, N. G. III. Watts, E. M.**

4D–209 551.585:551.582.1(931)

Garnier, Benjamin John, **The seasonal climates of New Zealand.** (In: Garnier, B. J. (*ed.*), **New Zealand weather and climate.** Christchurch, New Zealand, Whitcomb and Tombs, **1950.** p. 105–139, graphs, diagrs., refs.) **DLC**—In an attempt to provide a better description of the climate of New Zealand than could be obtained from charts of precipitation effectiveness or thermal efficiency (which do not show sufficient contrasts between many regions in New Zealand), the author has devised two scales of (a) moisture categories (7 classes) and (b) thermal categories (5 classes) which he uses to construct charts for each of the seasons for the two islands. This system, which he calls a "modified Thornthwaite system," shows up the contrasts in latitude, altitude, distance from sea and between the the two islands quite well. Extensive discussion, nomograms for quantitative evaluation of charts and some data are presented. (*Same item as* 3.6–173, June 1952, *MAB.*) *Subject Headings:* **1. Climatic classifications 2. Precipitation effectiveness 3. Thermal efficiency 4. Thornthwaite's classification 5. New Zealand.**—*M.R.*

4D–210 631.4

Grant, A. P., **Soil conservation in New Zealand.** *New Zealand Institution of Engineers, Wellington, Proceedings,* 36:269–313, **1950.** 13 photos, 6 tables. Abstracted from reprint. **DWB**—Various types of erosion are discussed and the influence of vegetation and of changes in vegetation, through human interference, upon the amount of erosion shown in statistical tables for New Zealand. Various methods of soil conservation including cultivation, engineering structures, terracing, etc., are recommended and statistics on their actual application in New Zealand offered. Evidence of

typical instances of erosion and soil conservation is given in a number of good photos of landscapes. Pages 301–313 contain discussions of the paper. *Subject Headings:* **1. Soil conservation 2. Soil erosion 3. New Zealand. I. New Zealand. Soil Conservation and Rivers Control Council, Wellington.**—*G.T.*

4D–211 551.509.33:551.590.2

Jones, Inigo, **Australian weather forecasts. Explanation of weather cycles; estimate of probable weather during 1950–1951.** And: **"My meteorological career."** And: **The work of Inigo Jones.** By R. B. Bousfield. Sydney, Long Range Weather Forecasting Trust, **1950.** 55 p. fig., tables. **NNA**—Cycles in general are discussed; some data (1866 and 1879) given, and curves drawn; long range forecast for 1950–1951 made. Second section gives personal history of INIGO JONES. Lastly, Jones' contributions to science are reviewed by BOUSFIELD. Earlier Australian weather forecasts . . . by INIGO JONES have been abstracted in Meteorological Abstracts as follows: those for . . . 17 years 1944–1960, *item* 9–42, Sept. 1950; for . . . 1948, *item* 2B–203, Feb. 1951; also his Long-range weather forecasting." *Queensland Geographical Journal*, 48, 1943–44, *item* 2B–178, Feb. 1951; and his "Seasonal forecasting, Brisbane, 1931," *item* 2B–106, Feb. 1951. *Subject Headings:* **1. Long range forecasting 2. Periodicities 3. Planetary influences 4. Sunspots 5. Jones Inigo 6. Australia. I. Nowland, G. W. II. Bousfield, R. B.**

4D–212 551.509.31(269)

§Langford, J. C., **Southern ocean analysis—some aspects.** *Weather Development and Research Bulletin*, Melbourne, No. 16:5–31, Dec. **1950.** 8 figs., 3 plates, 8 refs. **DWB**—An independent analysis of charts of ocean to south and east of Australia April 20–27, 1949 shows some difference from technique of Australian Weather Bureau. (*Same item as* 2.8–36, Aug. 1951, *MAB.*) *Subject Headings:* **1. Fronts 2. Weather forecasting 3. Australia 4. Antarctic Seas.**

4D–213 551.585:551.573

Leeper, G. W., **Thornthwaite's climatic formula.** *Australian Institute of Agricultural Science, Melbourne, Journal*, 16(1):2–6, March **1950. DLC**—A critical examination of Thornthwaite's climatic formula is presented. For several stations in Australia it underestimates the loss of water to the atmosphere in winter; it fails to distinguish between a dry Mediterranean summer and a wet monsoonal summer and it ignores the actual humidity. More reliable evaporation figures for Australia are obtainable by a simplified form of THORNTHWAITE'S evapotranspiration formula and by the saturation deficit equation. (*Same item as* 3.4–235, April 1952, *MAB.*) *Subject Headings:* **1. Thornthwaite's classification 2. Evapotranspiration 3. Australia.**—*I.L.D.*

4D–214 551.586:612

*Loewe, Fritz, **"Difficult days" at Melbourne.** *Weather Development and Research Bulletin*, Melbourne, No. 15:12–27, June **1950.** 16 tables. **DWB**—Weather which interferes with industry is due to high temperature, usually associated with strong dusty winds from interior and low humidity, less often anticyclonic. Tables give number of days per month with temperatures exceeding certain values, runs of hot days, heat and strong winds. Some extreme periods and their physical and physiological effects are described. Relative humidities are next considered. Night minimum temperature also rises in hot spells; with maximum 100°F it is generally about 70°F. Finally, cooling of buildings by wind after a hot spell is discussed. (*Same item as* 11–137, Nov. 1950 and 3G–225, July 1952, *MAB.*) *Subject Headings:* **1. Medical meteorology 2. Urban climatology 3. Melbourne, Victoria.**—*C.E.P.B.*

4D–215 551.582(265,267)

Maher, J. V. and Riley, P., **Weather in Australian waters.** *Marine Observer*, 20(148):105–115, April **1950.** 6 figs., ref. **DWB**—General description of winter and summer weather, tropical cycles, willy-willies and Cocos Island cyclones, and weather service to shipping. Cyclone tracks, barograms and mean air temperature Jan. and July. (*Same item as* 7–100, July 1950, *MAB.*) *Subject Headings:* **1. Weather 2. Southwest Pacific 3. Indian Ocean.**

4D–216 551.501.6:551.577.1 551.577.38

*Mead, A. D., **Mass curve studies of Auckland rainfall.** *Water and Water Engineering*, London, 52(646):607–616, Dec. **1949.** 7 figs., 3 tables. Reply by W. N. McClean, *ibid.*, 53(648):79, Feb. **1950.** fig. **DGS**—Monthly rainfall totals for Auckland for 94 years (1863–1946) are analyzed by the mass curve technique, to show the frequency duration and magnitude of critical drought periods. These curves can be compared with similar curves of cumulative stream flow anomalies (excess or deficiency) or can be substituted for stream flow data where none is available. Annual rainfall for each year, and monthly amounts for the dry periods (1884–9, 1895–6, 1912–15) are tabulated. MCCLEAN

presents a mass curve for the entire period (1863–1946) showing dry phase (1870–90), wet phase (1915–30) and recent moderately dry (1932–46) phase in Auckland rainfall. *Subject Headings:* **1. Precipitation data analysis 2. Drought 3. Mass curve studies 4. Auckland, New Zealand. I. McClean, W. N.**—*M.R.*

**4D–217** 551.510.52:621.396

Milnes, B. and Unwin, R. S., **A radio meteorological investigation in the South Island of New Zealand.** *Physical Society of London, Proceedings, Ser. B,* 63(8):595–616, Aug. 1, **1950.** 26 figs., 9 refs. **DWB**—The inversion that results when föhn winds blow out over the sea near Canterbury Bight has a pronounced effect on radio transmission. Meteorological factors and transmission measurements are analyzed. Some lapse rate and field strength contour charts are given. (*Same item as* 2.5–52, May 1951, *MAB.*) *Subject Headings:* **1. Radio transmission ducts 2. Super-refraction 3. New Zealand.**

**4D–218** 551.515:551.510.535(94)

Munro, G. H., **Travelling disturbances in the ionosphere.** *Royal Society of London, Proceedings, Ser. A,* 212:208–223, July 7, **1950.** 10 figs., 12 refs. **DLC**—Concluded that in southeast Australia, quasi-periodic disturbances of F layer with periods of 10–60 min. are frequent. (*Same item as* 10–55, Oct. 1950, *MAB.*) *Subject Headings:* **1. Ionospheric disturbances 2. Australia.**

**4D–219** 551.506.1(931)

*New Zealand. Meteorological Office, **Meteorological observations . . . 1928-1945.** Wellington, **1930–1950. DWB**—Tables of monthly and annual climatic means for all stations of New Zealand with summary comments on general weather for the year, annual map of rainfall departures from normal and some reproductions of instrumental records for certain days as well as data for selected stations for mean hourly atmospheric pressure, amount of bright sunshine, wind velocities and earth temperatures. Earlier (1869–1928) monthly and annual means were published in: *New Zealand. Census and Statistics Office, Official yearbook,* or: *Statistics of New Zealand. Subject Headings:* **1. Climatic data 2. Observational data 3. New Zealand. I. New Zealand. Census and Statistics Dept.**

**4D–220** 551.579.4:551.577.37(94)

Newman, B. W., **A lake is filled and other weather records.** *Weather Development and Research Bulletin,* Melbourne, No. 16:47–53, Dec. **1950.** photo. **DWB**—Excessive rains in nearly all months, Feb. 1949–June 1950, in Queensland, New South Wales and Victoria noted; Tasmania had long drought. (*Same item as* 2.7–153, July 1951, *MAB.*) *Subject Headings:* **1. Floods 2. Excessive rainfall 3. Australia 4. Tasmania.**

**4D–221** 551.577.34

Potter, J. S. and Potter, S. C., **A study of some N.S.W. rainfalls since 1859.** *Pastoral Review and Grazers Record,* 60(3):227–228, March **1950.** 3 tables. **DA**—The purpose of the study is to determine whether or not there began in 1898 a period of decreased rainfall. Table I, which can be divided into 3 periods (1859–1897, 1898-1946, 1947-1949), gives annual rainfall for duration of record for Bourke (1871–1949), Orange (1871–1949) and Sydney (1859–1949). Inspection of this table shows that the general average rainfall or better was reached more times in the first period than in the second. Table II shows the number of years in which the average was exceeded. Table III shows average rainfall in points for 10-year periods. The conclusion is that since the turn of the century there has been a lowering of the average rainfall (up to 30%) in the case of Bourke. *Subject Headings:* **1. Precipitation amount 2. New South Wales.**—*M.L.R.*

**4D–222** 551.558.2

Radok, Uwe, **Report on a flight investigation of lee wave disturbances near Melbourne.** *Weather Development and Research Bulletin,* Melbourne, No. 15:28–39, June **1950.** 4 figs., 3 tables, 7 refs. **DWB**—Horizontal flights in aircraft at altitudes from 3000 to 10,000 ft during strong easterly winds across the Dandenong ranges indicated evidence of wave-like disturbances in their lee, with a particularly marked region of descending air directly over the ridge. (*Same item as* 11–118, Nov. 1950, *MAB.*) *Subject Headings:* **1. Orographic effects 2. Upper air winds 3. Atmospheric disturbances 4. Australia.**

**4D–223** 551.501

Robertson, N. G., **The organization and development of weather observations in New Zealand.** (In: Garnier, B. J. (*ed.*), **New Zealand weather and climate.** Christchurch, **1950.** p. 7–25. 6 figs.) **DLC, NNA**—Growth and development of New Zealand weather stations to a total of 1000

of three main types: synoptic (108), climatological (102) and rainfall (670) are described; locations shown on map. Development of upper air observations before and since 1939 are discussed. Primary and secondary sources of observational material are listed. (*Same item as* 3.5–30, May 1952, *MAB.*) *Subject Headings:* **1. Meteorological services 2. New Zealand.**

**4D–224** 551.577.34:551.577.2(931)

Seelye, C. J., **Fluctuations and secular trend of New Zealand rainfall.** *New Zealand Journal of Science and Technology, Sec. B,* Wellington, 31(6):11–24, May **1950.** 4 figs., 8 tables, 6 refs. **DWB**—Rainfall over the Dominion and each island is summarized into an annual index, the 1911–40 mean being taken as 100. The dispersion of rainfall amongst stations in a given year is briefly discussed. The fluctuations in index from year to year are resolved into a longer period which correlates closely with the 11-year sunspot cycle and a shorter more irregular period averaging three years. The indices for 1863 to 1947 show a declining tendency at the average rate of at least four per cent and two per cent per century for the North and South Islands respectively, but such a trend implies a bias in the method of evaluating indices before 1890 and a reasonable adjustment increases these trend rates to about seven and three per cent per century. (*Same item as* 4.1–184, Jan. 1953, *MAB.*) *Subject Headings:* **1. Rainfall index 2. Rainfall distribution 3. Rainfall cycles 4. Sunspot cycles 5. New Zealand.**—*Author's abstract.*

**4D–225** 551.577.3(265)

Seelye, C. J., **Rainfall and its variability over the central and southwestern Pacific.** *New Zealand Journal of Science and Technology, Sec. B,* Wellington, 32(2):11–24, Sept. **1950.** 10 figs., 5 tables, 8 refs. Also: *New Zealand. Meteorological Office, Meteorological Office Note,* No. 35. **DWB**—The discussion is centered around a series of maps which convey the following rainfall information: average annual rainfall, the frequency of wet months with over 150% of average rainfall and of dry months with under 50% of average, the last being treated seasonally as well as annually. Some notes are made concerning surface winds in some exceptional rainfall years, on the persistence of dry months and on some selected periods of abnormal rainfall. Throughout, the equatorial dry zone with its southeastern extension figures prominently as a homogeneous region and this emphasizes the anomaly that the unmodified Tm air reaches the equator in that region without showing a transition to an Em air mass as would be customary elsewhere. (*Same item as* 4.1–182, Jan. 1953, *MAB.*) *Subject Headings:* **1. Rainfall variations 2. Rainfall frequencies 3. Rainfall extremes 4. Equatorial dry zone 5. Southwest Pacific.**—*Author's abstract.*

**4D–226** 551.311.12:551.583.2(931)

†Suggate, R. P., **Franz Josef and other glaciers of the Southern Alps, New Zealand.** *Journal of Glaciology,* London, 1(8):422–428, Oct. **1950.** 3 figs., table, 21 refs. **DLC**—Retreats, advances and associated meteorological conditions are discussed. (*Same item as* 2.2–189, Feb. 1951, *MAB.*) *Subject Headings:* **1. Glaciers 2. Climatic variations 3. New Zealand Alps.**

## 1951

**4D–227** 551.509.62:551.586:634.3

Angus, D. E., **Inclined axis frost fan trials in citrus orchards.** *Australia. Commonwealth Scientific and Industrial Research Organization, Section of Meteorological Physics, Sectional Report* No. 1, Jan. **1951.** 24 p. tables, diagr., biblio. **DWB**—The author tested the hypothesis that the range of the Australian type vertical axis fan which "sucks" down warm air can be increased by tilting the axis of the fan at a rather large angle to both the vertical and the horizontal. A description of the fan and of the experimental design and the temperature measurements obtained at various angles of tilt are given. Both the area and the range of the 2°F temperature rise increased progressively as the axis of the fan was tilted up to 62° from the vertical. (*Same item as* 3.9–78, Nov. 1952, *MAB.*) *Subject Headings:* **1. Frost protection 2. Orchard heating 3. Frost fans 4. Australia.**—*I.L.D.*

**4D–228** 551.509.3:551.582(02)(94)

§Ashton, H. T. and Maher, J. V. (*Australia, Met. Br.*), **Australian forecasting and climate.** Fairfield, Victoria, **1951.** 71 p. charts, diagrs., photos. **DLC**—A nontechnical guide to weather observations, general meteorology, synoptic analysis and forecasting with particular reference to Australia, and fundamentals of the climatology of Australia. The treatment is up to date and standard for such works, but the many illustrations, climatic charts, selected data for different elements of weather or climate, etc., for the Australian area provide a fresh perspective of meteorology for those in the Northern Hemisphere. The synoptic and climatic conditions are tied in with the general circulation of the earth and oceans, latitude, altitude, continentality, etc. Extremes of

temperature, rainfall, etc. are given for various sections of Australia. Typical synoptic charts are also included. (*Same item as* 3.7–67, July 1952, *MAB.*) *Subject Headings:* **1. Synoptic meteorology 2. Climate of Australia 3. Textbooks 4. Weather forecasting 5. Australia.**—*M.R.*

**4D–229** 551.577.21(94):634.9

Australia. Forestry and Timber Bureau, **Map of Australia showing principal commercial forest regions. 1950.** chart. **Notes to accompany a map showing the commercial forest regions of Australia.** *Australia. Forestry and Timber Bureau Leaflet*, No. 61, **1951.** 29 p. **GB-MO**—The chart shows the limits of rain forest, eucalyptus forest (high and low rainfall types), cypress pine forest and riverain forest, all limited to the east and southeast Nayens and Tasmania, and a small area south of Perth, W. A. It also includes mean annual isohyets and boundary between summer and winter seasons. The leaflet discusses the types of forest in relation to the rainfall in 35 different regions. *Subject Headings:* **1. Precipitation effects 2. Forest limits 3. Australia.**—*C.E.P.B.*

**4D–230** 551.5:629.13(265/6)

*Australia. Meteorological Branch, **A report on meteorological conditions affecting aviation over the Sydney to Vancouver air route.** [1951?] 99 p. 50 figs., tables, bibliog. p. 32. **DWB**—This study contains a summary of the weather, climate and flying conditions along the route from Sydney-Suva-Canton Islands-Honolulu-San Francisco-Vancouver, British Columbia, the flying conditions at the principal airports, general controls of weather, typical synoptic situations (tropical cyclones, extratropical cyclones, V-depressions and anticyclonic ridges across various legs of the airway) and appendices giving upper winds, wind roses, temperatures and relative humidities; tables of surface conditions at airports along the route and several not on the route; both mean conditions and frequencies as well as typical or sample situations are depicted in charts, diagrams and tables. *Subject Headings:* **1. Airways climatic data 2. Climatic summaries 3. Tropical meteorology 4. Sydney-Vancouver air route 5. Pacific Ocean.**—*M.R.*

**4D–231** 551.506.7:551.547(931)

Barnett, M. A. F., **Mean circulation at high levels over New Zealand.** *Journal of Meteorology*, 8(3):202, June **1951.** refs., table. **DWB**—A table of the mean heights of the 60 mb surface for each month at Auckland and Hokitika is presented. The data indicate that the wind is predominantly easterly in Dec. and Jan. but that westerlies prevail in other months. (*Same item as* 3.5–53, May 1952, *MAB.*) *Subject Headings:* **1. Upper air observation 2. General circulation 3. Wind regime 4. Auckland, New Zealand 5. Hokitika, New Zealand.**—*I.L.D.*

**4D–232** 551.506.5:551.481.1(94)

Bonython, C. Warren, **The evaporating waters of Lake Eyre.** *Weather*, 6(10):310–314, Oct. **1951.** 2 photos, 4 refs. **DWB**—Account of an expedition in May 1951 to investigate evaporation from Lake Eyre, re-formed for the first time for 30 years in 1949-1950. Temporary stations were set up on shore and in lake. (*Same item as* 3.4–51, April 1951, *MAB.*) *Subject Headings:* **1. Expeditions 2. Evaporation 3. Lake Eyre, Australia.**—*C.E.P.B.*

**4D–233** 551.57:633.11

Cornish, E. A., **The influence of rainfall on the yield of wheat in south Australia.** (In: Specialist Conference on Plant and Animal Nutrition in Relation to Soil and Climatic Factors, Australia, 1949, **Proceedings, 1951.** p. 42.) **DWB**—A summary of a paper which analyzed the rainfall in South Australia (1896–1841) and its relationship to the wheat yield. The regression of yield of rainfall, considered as a function of time assumes a mathematically simple parabolic form with a maximum during winter and zero in autumn and spring or early summer and the coefficients clearly indicate "the sub-optimal character of average seasonal rainfall over the great part of the season and almost throughout the wheat belt." *Subject Headings:* **1. Agricultural climatology 2. Wheat yield 3. South Australia.**—*I.L.D.*

**4D–234** 551.524.3

Deacon, E. L. and Groodin, I. S., **Continentality of the Australian climate.** *Weather*, 6(7):221–222, July **1951.** fig., tables. **DWB**—Brief article on changes and ranges of temperature at some Australian stations. (*Same item as* 2.10–101, Oct. 1951, *MAB.*) *Subject Headings:* **1. Continentality 2. Temperature variations 3. Australia.**

**4D–235** 551.583:551.311.12

Gage, Maxwell, **The dwindling glaciers of the upper Rakaia Valley, Canterbury, New Zealand.** *Journal of Glaciology*, London, 1(9):504–507, March **1951.** fig., 3 photos. English and German summaries. **MH-BH**—Recession of these glaciers discussed. (*Same item as* 2.10–161, Oct. **1951.** *MAB.*) *Subject Headings:* **1. Climatic variations 2. Glaciers 3. New Zealand.**

4D–236 551.594

*Garner, D. M., **Preliminary investigation of aurora australis activity 1931 to 1949.** *New Zealan Journal of Science and Technology, Sec. B,* 33(1):11–14, July **1951.** 3 figs., table, 7 refs. **DLC—** Records collected at Carter Observatory, Wellington, include those from New Zealand (and som from Australia) from 1931–1949, from Tasmania since 1939, from Campbell Island from 1941 ar from Heard and Macquarie Islands since 1948. Discussion covers auroral frequency, annu variation of auroras and correlation between auroral activity and sunspot numbers. *Subject Hea ings:* **1. Aurora australis 2. New Zealand 3. Tasmania.**—*M.L.R.*

4D–237 551.573:551.579(931)

Garnier, B. J., **The application of the concept of potential evapotranspiration to moisture prob- lems in New Zealand.** *New Zealand Geographer,* 7(1):43–61, April **1951.** 5 figs., 4 tables, 14 refs. **NNA**—THORNTHWAITE's theory of water need or potential evapotranspiration, considered in relation to actual precipitation is applied to the various regional climates of New Zealand. Contrasts between coast and interior are pointed out; decrease of annual total of potential evapotranspiration with altitude; balance of water need and precipitation; water deficiency in Central Otago, drought and humid regions, application of the concept of potential evapotranspiration to New Zealand areas of slight and considerable moisture deficiency, are discussed. Summary tables and schematic charts included. *Subject Headings:* **1. Potential evapotranspiration 2. Moisture deficiency 3. Thorn- thwaite's classification 4. New Zealand.**

4D–238 551.577:63(94

Gentilli, Joseph, **Bioclimatic controls in Western Australia.** *Western Australian Naturalist* Perth, 1(6):81–84, 104–107, 120–126, Sept. 13, **1948.** figs., 18 refs. Also: **Bioclimatic changes in Western Australia.** *Ibid.,* 2(8):175–184, April 30, **1951.** 6 figs., 14 refs. Abstracted from reprint **NNA**—1) Such aspects as temperature, evapotranspiration, water balance, hygrostatic index, etc are considered rather generally. 2) Author attempts to assess the exact amount of climatic chang required in order to cause significant change in the biological environment of Western Australia. H concludes that this environment is more affected by movements of the arid margin and by a decreas rather than by an increase in rainfall. Present and "needed" conditions are noted and charted (*Same item as* 3.6–141, June 1952, *MAB.*) *Subject Headings:* **1. Bioclimatology 2. Climatic varia tions 3. Rainfall 4. Western Australia.**

4D–239 551.586:612:551.577.32(94

Gentilli, J., **Climatic discomfort in W. A.** *Western Australia. University. Geographica Laboratory, Research Report* No. 24, April **1951.** 18 p. graphs, diagr., tables, refs. **DWB**—In orde to establish a rational and scientific basis for the climatic discomfort allowances provided to worker in Western Australia by the State Arbitration Court, the climate of Western Australia is subdivide into climatic zones as characterized by different mean annual effective temperatures, and the comfor of each zone is assessed in terms of comfort levels for sedentary workers established by YAGLO and in terms of comfort required by different kinds of physical activity. The author suggests tha the "annual number of day-degrees above 69°F (effective temperature) be taken as the criterion fo climatic discomfort arising from heat, and that heat discomfort zones be determined for every 60 annual day-degrees above 69°F (E.T.)." The zones of climatic discomfort for Western Australi are shown on a map. Also the history of climatic discomfort allowances in Australia is reviewe (*Same item as* 3.11–246, Nov. 1952, *MAB.*) *Subject Headings:* **1. Climatic discomfort 2. Clima of Western Australia 3. Annual temperature variations 4. Comfort zones 5. Western Australia.**— *I.L.D.*

4D–240 551.582:633(9

Gentilli, Joseph, **Climatological work in Western Australia. I. The world and ourselve II. Rainfall and wheat. III. The variability of the rainfall. IV. Evaporation and transpiratio V. Rainfall effectiveness.** [A series prepared by Dr. Gentilli for the *Gazette.* n.d.] 3 p. eac approx. figs., maps, tables. **MH-BH**—Leaflets giving popular accounts of climatic work in Weste Australia. (*Same item as* 2.7–158, July 1951, *MAB.*) *Subject Headings:* **1. Climatology 2. Agr cultural climatology 3. Western Australia.**

4D–241 551.582(9

*Gentilli, Joseph, **Weather and climate in Western Australia.** Western Australian Governme Tourist and Publicity Bureau, [n.d.] 22 p. 23 maps, tables. **MH-BH**—Describes the clima of Perth and of 10 climatic regions of Western Australia, with useful monthly averages of clima data at 8 places and maps of temperature, rainfall, evapotranspiration and water balance. (*Sa item as* 2.7–159, July 1951, *MAB.*) *Subject Headings:* **1. Climatology 2. Western Australia.** *C.E.P.B.*

4D–242 551.582.2:551.577.2(94):633.11

*Hounam, C. E., **Climate of the West Australian wheat belt with special reference to rainfall over marginal areas.** *Australia. Meteorological Branch, Studies in Applied Climatology, Pamphlet,* No. 1, 1947. 17 p. 9 charts, tables, 8 refs. Also: **Climate of the south-west wheat belt of N.S.W. with special reference to rainfall over marginal areas.** *Ibid.*, No. 2, 1947. 22 p. 22 maps, tables, 5 refs. And: **Climate of the western district of Victoria.** *Ibid.*, No. 3, 1949. 52 p. 30 figs, 4 tables, 6 refs. And: **Climate of the north-west wheat belt of N.S.W. with special reference to rainfall over marginal areas.** *Ibid.*, No. 4, 1951. 31 p. charts, 9 tables, graphs, 6 refs. **DWB**—All papers discuss physiography, temperature and rainfall of the respective regions with special emphasis in the first two on effective rainfall in the arid sections, and in the third with particular reference to dairying needs. Data are presented on mean and extreme temperatures, frost frequency, mean annual, monthly and seasonal rainfall, on seasonal rainfall probability and on effective rainfall, as well as useful schematic charts. (For fuller abstracts *see items* 8–113, Aug. 1950 and 2.8–2.58, Aug. 1951, *MAB.*) *Subject Headings:* **1. Agricultural climatology 2. Rainfall probability 3. Wheat production 4. Dairying 5. Western Australia 6. New South Wales 7. Victoria.**

4D–243 551.582:631.48(931)

*Hurst, F. B., **Climates prevailing in the yellow-gray earth and yellow-brown earth zones in New Zealand.** *Soil Science,* 72(1):1–19, July **1951.** 5 figs., 11 tables, 8 refs. Also: *New Zealand. Dept. of Scientific and Industrial Research. Soil Bureau Publication,* No. 22, **1951. NNA**—Four methods of evaluating climate are discussed and applied to the problem of climate difference between regions of yellow-gray and of yellow-brown soils in New Zealand and of the transitional types between. Characteristics of each soil group are noted. Thornthwaite's "rational" classification is judged most useful in dealing with the problem. Climatic indexes for 38 N. Z. stations arranged in soil groups are summarized in tables, using data up to 1945. Essential differences of climate prevailing at yellow-gray, yellow-brown and transitional earth stations are diagrammed and discussed. *Subject Headings:* **1. Soil types 2. Climatic classification 3. New Zealand.**

4D–244 551.513.2:551.557

Hutchings, J. W. and Row, Ann L., **The mean circulation at high levels over New Zealand.** *New Zealand. Meteorological Service, Circular Note,* No. 69, **1951.** 2 p. table. **GB-MO**—Monthly averages of the height of the 60 mb surface computed for Auckland and Hokitika. From these the mean zonal components of wind between them are derived and show predominantly easterly winds in Dec. and Jan. and westerly winds prevailing in other months with a winter maximum of 15–20 knots. *Subject Headings:* **1. Winds in the stratosphere 2. Atmospheric circulation 3. Auckland, New Zealand 4. Hokitika, New Zealand.**—*G. J. Evans.*

4D–245 551.515.7(84)

James, R. W., **The structure of steady-state anticyclones.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences,* 4(3):329–343, Sept. **1951.** 2 figs., table, 5 refs., 16 eqs. **MH-BH**—It is found that symmetrical anticyclones of the Australian region exhibit roughly similar pressure profiles. The total pressure rise within a high is approximately proportioned to the area covered by the disturbance, large systems in higher latitudes being more intense than small systems in lower latitudes. These structural properties are shown to be a consequence of the requirement for gradient-wind balance within an anticyclone, which requirement is shown to limit the intensity of a high of specified size. The theory indicates that the variation of the size of anticyclones should be restricted, and that disturbances in higher latitudes should have higher mean intensities. Both these requirements are borne out by observation. (*Same item as* 3.9–107, Sept. 1951, *MAB.*) *Subject Headings:* **1. Anticyclone structure 2. Anticyclone mechanics 3. Australia.**—*Author's abstract.*

4D–246 551.582.2:69(94)

*Keough, J. J., **Selected Australian climatic data for use in building design.** *Australia. Experimental Building Station, Sydney, Technical Study,* No. 36, April **1951.** 95 p. map, tables. Price: 7sh. **DWB**—The work consists mainly of tables for 83 stations giving information most frequently asked for by architects. They include for summer and winter—mean maximum and minimum temperature, days of maximum above or below certain limits, minimum relative humidity, sunshine, rainfall, wet days, maximum fall in 5 min, rain-bearing and dust-bearing winds and notes on phenomena, strongest winds, etc. (*Same item as* 4.1–218, Jan. 1953, *MAB.*) *Subject Headings:* **1. Climatic data 2. Building design 3. Australia.**—*C.E.P.B.*

4D–247 551.577.3

Leeper, G. W., **Variability of rainfall.** (In: Specialist Conference on Plant and Animal Nutrition in Relation to Soil and Climatic Factors, Australia, 1, 1949, **Proceedings. 1951.** p. 33–35. 6 refs.) **DWB**—The two main ways in which rainfall variability can be mapped are: 1) percentage

variability in which mean or standard deviation is calculated as a percentage of the mean and 2) th frequency of years in which the rain exceeds a given high value or is less than a given low one. Th relative merits of any standard and mean deviation in calculating percentage variability, the variou measures of variability used and the value of percentage variability from the technical rather tha practical standpoint are discussed. The use of the second method, which is of practical value, is discussed with particular reference to Australia. *Subject Headings:* **1. Rainfall variations 2. tralia.**—*I.L.D.*

**4D–248** 551.577.2(94):551.58

§Lillywhite, J. W., **A remarkable rainfall distribution; a short study in convergence.** *Weathe Development and Research Bulletin*, Melbourne, No. 17:36–38, Aug. **1951.** 6 figs. **DWB**—Repor is made on a synoptic analysis of conditions which caused rainfall in one part of Victoria but not i another, affording an interesting study of effects of convergence and divergence. (*Same item a* 3.4–205, April 1952, *MAB.*) *Subject Headings:* **1. Rainfall distribution 2. Convergence 3. Vic toria.**

**4D–249** 551.584.4:631:551.588.6:551.509.6(94

Loewe, Fritz, **Some microclimatic considerations of agricultural interest.** *Australian Institute o Agricultural Science, Journal*, 17(1):2–6, March **1951.** tables. **DLC**—A general discussion, sup ported by representative tabular data, of the several aspects of microclimate as affecting crops Variations in radiation on different exposures or inclinations at various latitudes south of the equato and various seasons, variations in heat loss and gain on the ground with different soils or covers temperature gradient in crops in comparison with the free air, and effects of vegetation on humidity on wind velocity, etc, are treated. Finally, methods of modifying the microclimates such as shelte belts, increasing water surfaces, artificial rainfall, heating and sprinkling orchards or using win machines to prevent frost damage are mentioned. (*Same item as* 3.11–235, Nov. 1952, *MAB. Subject Headings:* **1. Microclimatology 2. Climatic control 3. Agronomy 4. Agriculture 5. Aus tralia.**—*M.R.*

**4D–250** 551.510.53

McNicol, R. W. E. and Gipps, G. de V., **Characteristics of the $E_s$ region at Brisbane.** *Journa of Geophysical Research*, 56(1):17–31, March **1951.** 10 figs., 10 refs. **DWB**—A study based o routine h'f records of the $E_s$ layer taken at Brisbane, Australia, between June 1943 and Dec. 194 shows at all seasons the critical frequency is lowest at dawn. In summer it reaches a maximum a 10 hr and declines gradually. In winter the rise is slower and the maximum occurs around 14 h dropping markedly by sunset. The observations suggest that there are 2 distinct types of $E_s$ a Brisbane—one found at great heights and descending to its final position, the other formed in situ The first is predominant is summer and the second in winter. No evidence of correlation could b found with sunspot numbers, ionospheric storms or meteor occurrence frequency, and the conclusio is reached that the Brisbane $E_s$ is not predominantly of meteoric origin. There is some sligh evidence of correlation between the constant height type of $E_s$ and F region diffuseness. (*Sam item as* 3.6–71, June 1952, *MAB.*) *Subject Headings:* **1. E layer 2. Ionospheric variations 3. Bris bane, Queensland.**—*From authors' abstract.*

**4D–251** 551.594.7:621.39

§*New Zealand. Dept. of Scientific and Industrial Research, **Report of the factual data from th Canterbury Project. A radio-meteorological investigation in the South Island of New Zealan** London, Pub. by the Dept., **1951.** 3 v. (857+283+187 p.) figs., tables, graphs, refs. v. 2– oversize. **DWB**—These three large volumes comprise the final report, including all of the data charts and analyses, of a joint scientific investigation conducted between Sept. 1946 and Dec. 194 by the Departments of Scientific and Industrial Research of the United Kingdom and of Ne Zealand. The "Canterbury Project" was planned in 1944 to provide information on the formatio and behavior of low level atmospheric ducts caused by advection of warm dry continental air over th neighboring sea. An area in Canterbury Province of South Island, New Zealand was considered th most suitable. Volume 1: Descriptive and Numerical Data, contains an analysis of all of th meteorological and radio data collected during this period and all of the detailed surface, upper ai synoptic and oceanographic data for the entire area around New Zealand. Airplanes, radar, ba loons, radiosondes and ship observations were used intensively and extensively. Each separat situation is described and analyzed. Surface (coded) synoptic observations are given for 00, 0 06, 09, 12, 15 and 18h for a score of stations. The observational, operational and theoretical co siderations are also treated at great length and in detail. Volume II: Meteorological Data, consis of a large "atlas" type presentation of graphs and charts prepared from the meteorological da

collected during this survey. A detailed topographical map of the region and a cross section showing the relief in relation to observation stations is followed by detailed isopleth and sounding diagrams of potential temperature, specific humidity, temperature and upper air winds for levels from the sea level to 2000 ft height. Actual anemograph traces for the 50 foot level are reproduced for several stations for each of the 50 or so situations studied. Synoptic charts are presented for 1200 h local time for the Australasian region for all of the periods when data were obtained. Isopleth cross sections of potential temperature and specific humidity are given in great detail for a range of 25 mi of land and 120 mi at sea (to 1000 ft). Soundings are given for both land and sea. Volume III: Radio-wave Propagation Data, also consists of large detailed graphs and isopleth cross sections of modified refractive index, height gain curves, etc. from aircraft and ship soundings from 0 to 1000 or 2000 ft height. About 50 separate situations are thoroughly analyzed in this fashion. (*Same item as* 4.3–11, March 1953, *MAB.*) *Subject Headings:* **1. Radiometeorological investigations 2. Radio wave propagation 3. Tropospheric propagation 4. Radio transmission 5. Canterbury Project 6. South Island, New Zealand. I. Great Britain. Dept. of Scientific and Industrial Research.**—*M.R.*

**4D–252** 551.585

Prescott, J. A., **Climatic expressions and generalized climatic zones in relation to soils and vegetation.** (In: Specialist Conference on Plant and Animal Nutrition in relation to Soil and Climatic Factors, Australia, 1949, **Proceedings, 1951.** p. 27–33. fig., table, refs.) **DWB**—The author presents a concise review of the various attempts to measure the influence of the evaporating power of the atmosphere on the effectiveness of rainfall. These include the climatic systems of KÖPPEN and THORNTHWAITE and the indexes of MEYER, DE MARTONNE and PRESCOTT. The author points out that temperature and evaporation and likewise saturation deficit and evaporation are out of place under arbitrary conditions. Australian work on the use of rainfall—evaporation relationships in applied climatology is reviewed; this includes studies on the climate of the wheat belt of Western Australia. *Subject Headings:* **1. Climatic classifications 2. Evapotranspiration 3. Australia.**—*I.L.D.*

**4D–253** 551.513.2:551.557

Radok, Uwe and Grant, Alison M., **A note on cross section technique.** *Weather Development and Research Bulletin*, Melbourne, No. 17:39–38, Aug. **1951.** 2 tables, eqs. **DWB**—Since the accuracy of geostrophic winds, which are determined from aerological cross sections, depends on the accuracy of the slope of the constant pressure surfaces, it is only possible to obtain accurate estimates for the Australian area if the contours are nearly straight and are running in a West-East direction. Smoothing techniques introduce further inaccuracy. This can be somewhat reduced by use of potential temperature and by drawing isentropes at 5° intervals and by following other simple rules, which are set forth for determining the entire velocity field for meridional cross sections. (*Same item as* 3.6–86, June 1952, *MAB.*) *Subject Headings:* **1. Aerological cross sections 2. Geostrophic winds 3. Isentropic analysis 4. Australia.**—*M.R.*

**4D–254** 551.579.1:631.6

Riddel, J. O., **Development of irrigation in a semi-humid climate: The Ashburton-Lyndhurst Project, New Zealand.** (In: United Nations Scientific Conference on the Conservation and Utilization of Resources, Lake Success, N. Y. 1949, **Proceedings, v. 4, Water resources, 1951.** p. 375–378.) **DWB**—The annual rainfall is about 30″, but hot, dry winds, light soils and fast drainage decrease the amount of moisture available for plants so that irrigation is necessary. Technical and economic questions are discussed. (*Same item as* 4.3–238, March 1953, *MAB.*) *Subject Headings:* **1. Irrigation 2. Drainage 3. Ashburton County, New Zealand.**—*A.A.*

**4D–255** 551.501.9:551.594.6

van de Hulst, H. C., **Radiosterrewacht Sydney.** [Sydney Radio Astronomical Observatory.] *Hemel en Dampkring*, 49(5):81–90, **1951.** 7 figs., table. **DLC**—A detailed, illustrated survey of the work done at Sydney Observatory, with special emphasis on recording solar bursts, observations of the solar corona, the temperature of the moon, etc. which can be studied by means of radio propagation or reception equipment. Other observatories in various parts of the world such as the ones at Manchester, England or Leiden, Holland, and workers such as REBER in the United States, COVINGTON in Canada, LAFFINEUR in France are mentioned. However, the Sydney Observatory is still foremost in the world in radio-astronomy investigations. (*Same item as* 3.1–30, Jan. 1951, *MAB.*) *Subject Headings:* **1. Microwave research 2. Radio observatories 3. Australia. Commonwealth Observatory 4. Sydney, New South Wales.**—*M.R.*

1952

4D–256 551.524.37:634.21

Atkinson, J. D., **Frost damage to apricot blossoms and fruit.** *New Zealand Journal of Science and Technology, Sec. A*, 34(3):277–285 Oct. 1952. 2 figs., 6 tables, 6 refs. **DLC**—Describes equipment and procedures used during four seasons to artificially freeze two varieties of apricot blossoms and small fruit to determine point at which frost damage occurs. Tables show percentage damage at different temperatures for various stages of growth. Two conclusions drawn: 1) flowers become less resistant to frost as they develop, and 2) the percentage damage increases as time of exposure to a critical temperature is lengthened. Other experiments were carried out to measure bud temperatures under frost conditions and to determine effect of free water on flowers and fruit under freezing conditions, effect of age of fruiting wood on frost damage and effect of a sudden drop of 1°F below critical temperature. Results of experiments are tabulated. *Subject Headings:* **1. Frost damage to apricots 2. Artificial freezing of plants 3. Central Otago, New Zealand.**—*M.L.R.*

4D–257 551.584.61:699.86(94)

Australia. Commonwealth Experimental Building Station, **Thermal insulation.** *Australia. Commonwealth Experimental Building Station, Notes on the Science of Building*, No. 25, Sept. 1952. 4 p. diagrs., 3 refs. **DWB**—A concise quantitative summary of the thermal insulation of buildings for the Australian winter and summer and for hot humid climates. With the aid of diagrams the author discusses types of thermal insulations, thermal transmission, insulating materials; insulation during winter with intermittent heating in buildings of heavy and light construction. Insulation of unheated bedrooms and the problem of coldness underfoot; and insulation during the summer season in dry locations. Various recommendations for insulation of house conditions are presented. *Subject Headings:* **1. Building design 2. Insulation 3. Australia.**—*I.L.D.*

4D–258 551.582:629.13(94)

*Australia. Meteorological Branch, **A report on meteorological conditions affecting aviation over the Sydney to Darwin air route.** Melbourne [1948]. 65 p. 29 figs., tables, refs. **DWB.** Also: **Report on meteorological conditions on the Darwin-Singapore air route.** [1952?] 48 p. tables, 33 figs., 16 refs. **MH-BH**—Purpose of reports is to use all recent knowledge acquired in war and since to provide up-to-date account of weather conditions affecting aviation on Australian air routes. Pt. I of first report briefly outlines flying weather along the Sydney-Darwin route and at principal airports; Pt. 2, "General synoptic climate," forms a purely meteorological discussion of the region, i.e., air masses, their interaction with upper winds, icing, clouds, visibility, squalls, thunderstorms and their effects on flying. Climatic data appended for selected stations: Mascot, Darwin, Cloncurry, Charleville, Daly Waters. Isobaric charts, seasonal upper wind roses, and charts of typical frontal and synoptic conditions included. The second report contains similar treatment for the Darwin to Sourabaya and Sourabaya to Singapore air routes, with details for other airports en route. *Subject Headings:* **1. Aeronautical meteorology 2. Airways climatic data 3. Sydney-Darwin air route 4. Darwin-Singapore air route.**

4D–259 551.509.67

Bowen, E. G., **Australian experiments in artificial rain-making.** *American Meteorological Society, Bulletin*, 33(6):244–246, June 1952. 4 refs. **MH-BH**—In this talk presented at a Weather Bureau Seminar, Washington, D. C., Nov. 7, 1951, Dr. Bowen discussed the pitfalls standing in the way of the experimenter in artificial precipitation, the aim of Australian research on cloud seeding, and the results and achievements. The experiments, most of which were conducted with dry ice dropped into the tops of clouds from an airplane and the special cloud conditions under which operations were carried out, are described. Also silver iodide seeding experiments, weather conditions under which dry ice seeding may be of value and the spraying of warm clouds with water in order to induce coalescence are discussed. *Subject Headings:* **1. Artificial precipitation 2. Cloud seeding 3. Australia.**—*I.L.D.*

4D–260 551.582(93)

**The climate of the world. 5. Australia and New Zealand.** *Weather*, 7(9):279–282, Sept. 1952. diagrams. **DWB**—Diagrams of monthly temperature, pressure and rainfall at 18 places in Australia, 6 in New Zealand, and Port Moresby (New Guinea), Tulagi (Solomon Is.) and Suva (Fiji). (*Same item as* 4.3–243, March 1953, *MAB.*) *Subject Headings:* **1. Local climates 2. Australia 3. New Zealand 4. Pacific Ocean.**—*C.E.P.B.*

4D–261 551.577:551.501.45

Cuthbertson, E. G., **Some rainfall characteristics at Trangie Agricultural Experiment Station.** *Australian Institute of Agricultural Science, Melbourne, Journal,* 18(1):19–21, March **1952.** 2 figs., 2 tables, 4 refs. **DA**—Station is 250 mi NW of Sydney at an elevation of 700 ft. "Analysis based on 33 years of records of rainfall measurements for the 24-hour period ending at 9 a.m. each day." The winter period April to Sept. receives 7.84 in. in 30 rain days and the summer period Oct. to March 8.67 in. in 25 rain days. Seasonal rainfall expectancy calculated for these periods is shown in Table I. "Table II shows the proportion of the seasonal rainfall falling at different rates." Seasonal frequency of maximum daily rainfall and annual and seasonal frequency of rain-free periods of specified length are shown in figs. The risk of water and wind erosion exists at Trangie at all seasons. (*Same item as* 4.4–198, Pt. I of this issue.) *Subject Headings:* **1. Rainfall data analysis 2. Long period records 3. Erosion 4. Trangie, New South Wales.**

4D–262 551.557.3:551.501.8

*Edwards, H. N., **Some measurements of velocity of high altitude winds at Sydney, NSW.** *American Meteorological Society, Bulletin,* 33(2):56–59, Feb. **1952. MH-BH**—A method which involves the use of a balloon assembly, consisting of a small silver-coated balloon, acting as a radar reflector, within a large meteorological balloon and of an air-warning radar set operating on a wave length of 25 cm with a maximum power of 500 kw and pulse duration of 4 microseconds, for measuring horizontal wind velocities at high altitudes is described. Wind velocity measurements made at Sydney during March–Aug. 1949 indicate a maximum speed at 40,000 ft of about 70 mph from a westerly direction and a minimum speed of about 5 mph at 70.000 ft, which had a westerly direction during April–June and an easterly direction during July–Aug. Tables showing mean monthly maximum wind speeds and individual cases of minimum wind speeds are given. (*Same item as* 4.1–155, Jan. 1953, *MAB.*) *Subject Headings:* **1. Upper air winds 2. Radarsondes 3. Sydney, New South Wales.**—*I.L.D.*

4D–263 551.513:551.557

Gibbs, W. J., **Notes on the mean jet-stream over Australia.** *Journal of Meteorology,* 9(4):279–284, Aug. **1952.** 9 figs., 11 refs. **DWB**—From charts of pressure surfaces for 700–100 mb levels (unpublished) cross sections of geostrophic winds normal to 130° and 150°E are drawn. Winter profiles of these at 200 mb are compared with others for S. and N. Hemisphere and show general agreement, with a peak of about 100 knots in 27°. In summer profiles are much weaker and less regular. Charts of mean speed at 200 mb over Australian region are drawn for July and Jan. showing some variation with longitude including a double jet stream in 150°E. (*Same item as* 4.2–107, Feb. 1953, *MAB.*) *Subject Headings:* **1. Jet stream 2. Australia.**—*C.E.P.B.*

4D–264 551.5:681.177

Halsted, D. E., **Introduction of punch card methods into the Australian meteorological service.** *Weather,* 7(2):54–55, Feb. **1952.** fig. **DWB**—Describes experiences in punching and machine tabulating upper air and airfield data; cards described. Extension to rainfall data considered. *Subject Headings:* **1. Punched card applications 2. Australia.**—*C.E.P.B.*

4D–265 551.582(94, 82)

Prescott, J. A., Collins, Joyce A. and Shirpurkar, G. R., **The comparative climatology of Australia and Argentina.** *Geographical Review,* 42(1):118–133, Jan. **1952.** 10 figs., tables, 13 refs. **NNA**—This study illustrates the application of two climatic concepts developed in recent years at Waite Agricultural Research Institute to a comparative analysis of Australia and Argentina; the concepts are the determination of efficiency of rainfall in any month by reference to both precipitation and evaporation in that month and the definition of temperature regimes in terms of the harmonic values of mean, amplitude and phase which enable comparisons to be readily made and parallels established between areas having approximately the same temperature regimes throughout the year. The comparison of Australia and Argentina is based on estimates of the length of the season of effective rainfall and its timing and on the establishment of roughly parallel temperature regimes. Comparative schematic charts are drawn and some comparative moisture data for Huinco Renancó, Argentina, and Forbes and Rutherglen, Australia, are tabulated. Concluded that in some regions of the two countries sufficient parallels exist to serve as a basis for further detailed comparisons of climate, plant associations and cropping systems. (*Same item as* 3C–252, March 1952, *MAB.*) *Subject Headings:* **1. Agricultural climatology 2. Homo-climates 3. Rainfall 4. Temperature 5. Australia 6. Argentina.**

4D–266 551.506.7:551.557.2(931)

Row, Ann L., **Upper winds over Auckland.** *New Zealand. Meteorological Service, Circular Note,* No. 78, **1952.** 1 p. +5 tables. **GB-MO**—Seven years of radar wind observations at Auckland

are used to derive monthly means, resultant winds and the seasonal frequency distribution for 10,000, 18,000, 30,000 and 40,000 ft levels. *Subject Headings:* **1. Upper air wind data 2. Auckland, New Zealand.**—*G. J. Evans.*

**4D–267** 551.509.67:551.509.31(94)

*Smith, E. J., **The influence of meteorological conditions on rainmaking in the Sydney area.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences,* 5(1):87–103, March **1952.** 9 figs., 5 tables. **MH-BH**—Between Jan. 1, 1948 and June 30, 1950, 88 flights were made within 150 miles of Sydney, Australia, to stimulate rainfall by artificial means. These flights are tabulated and classified according to synoptic situation, height of freezing level above or below normal, water content of cloud 2000 ft >freezing level, difference in height between 0 and +10°C isotherm. These criteria are correlated individually with relative success of attempts (whether rain was induced, reached the ground or not), and the most important criteria thus determined. High water content 2000 ft above freezing level was a good criterion for success, but even better was a "rainmaking index" made up from synthesis of various parameters. For 1948, 1949 and 1950 the number of possible days for rainmaking was 45, 33 and 8. Synoptic situations favorable for rainmaking are illustrated. Forecasts from synoptic charts alone are better indication than when yesterdays radiosonde data are used. Improvement might occur if today's ascent were available just prior to the flight. (*Same item as* 4.2–76, Feb. 1953, *MAB.*) *Subject Headings:* **1. Cloud seeding 2. Artificial precipitation 3. Sydney, New South Wales.**—*M.R.*

**4D–268** 551.509.33

Treloar, H. M., **Seasonal forecasting in Australia—correlation method and general problems.** *Australian Institute of Agricultural Science, Melbourne, Journal,* 18(1):13–18, March **1952.** fig. **DLC**—The correlation method of long range forecasting is discussed in general terms. This method has been practiced for the last thirty years in forecasts covering period of several months issued by the Met. Dept. of India. The applicability of the method to conditions in Australia is being studied by a seasonal forecasting unit in the Dept. of Met., University of Melbourne, Australia. The present paper reports some of the conclusions reached by this unit regarding the expected accuracy of long range forecasts in Australia and the usefulness of such forecasts. *Subject Headings:* **1. Long range forecasting 2. Seasonal forecasting 3. Forecast accuracy 4. Australia.**—*G.T.*

**4D–269** 551.525:551.524.3(944)

West, E. S., **A study of the annual soil temperature wave.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences,* 2(5):303–314, June **1952.** fig., 2 tables. 9 refs., 9 eqs. **MH-BH**—Soil temperatures recorded at Griffith over an 8 year period at a depth ranging from 1 in. to 8 ft have been examined and compared with air temperatures. The observed fluctuations in the soil temperatures fit closely the theoretical equation for the propagation of a simple harmonic temperature wave into the soil. The diffusity of the soil has been deduced and compared with values found by other workers in other localities. The annual wave of the daily mean temperature at the surface of the soil has been deduced and compared with the annual wave of the daily mean air temperature and the differences in the means, amplitudes, and phase displacements have been discussed. *Subject Headings:* **1. Soil temperatures 2. Temperature variations 3. Soil surface temperatures 4. Griffith, New South Wales.**—*Author's abstract.*

## 1953

**4D–270** 551.513:551.515:551.557:551.524.7

Gibbs, W. J., **A comparison of hemispheric circulations with particular reference to the western Pacific.** *Royal Meteorological Society, Quarterly Journal,* 79(339):121–136, Jan. **1953.** 19 figs., table, 13 refs. **DWB**—The distributions of cyclones and anticyclones in midwinter and midsummer (Jan., July) in the N and S hemispheres are compared and their zonal frequencies plotted. The mean geostrophic W wind profiles up to 100 mb centered on 150°E are compared, and a general summary is given of the nature of the circulation, especially near Australia, and the effect of the different configuration of the two hemispheres on the development of anticyclonic vortices is discussed. *Subject Headings:* **1. Zonal perturbations 2. Australia.**—*C.E.P.B.*

**4D–271** 551.582.2(94)

†*Australia. Bureau of Census and Statistics, **Official yearbook of the Commonwealth of Australia. 1901–to date. NNA**—Notes, data, articles on climate and meteorology are contained in every issue. *Official Yearbook* No. 38 (1951) has a good summary discussion of all usual elements in different regions of Australia along with 30-year climatic means and extremes, 1911–1940, for major cities. Schematic diagrams included. Meteorological information from some of the yearbooks have been reprinted as *Bulletins* of the Meteorological Branch of Australia. *Subject Headings:* **1. Climate of Australia 2. Climatic data 3. Yearbooks 4. Australia.**

**4D–272** 551.577.21(94)

Australia. Meteorological Branch, **Rain map of Australia for the year . . .** Melbourne, 1911 - o date. Yearly sheets. **NNA**—Detailed annual rainfall map, and after 1914, monthly maps as vell, plus notes, tables of means, and small maps showing areas above average for previous years re given. *Subject Headings:* **1. Precipitation charts 2. Annual rainfall maps 3. Australia.**

**4D–273** 551.509.2(94)

§Australia. Meteorological Branch, **Synoptic weather chart. 1908–1935; 1937–1940; 1946; 1949–1951.** [Melbourne] **1908–to date.** Daily synoptic charts, bound in 35 vols. Also: **Daily analysis for the month . . .** Melbourne, Jan. 1940–to date. **NNA**—Small daily synoptic charts of the whole Australia-New Zealand-sub-Antarctica area are published along with notes on the synoptic conditions for each day; they comprise a series of monthly summaries of the weather over the region as prepared by Central Analysis Section, C.M.B., Melbourne; continuation of the former *AMFA* notes but with more detail in daily charts. *Subject Headings:* **1. Synoptic charts 2. Synoptic analysis 3. Daily weather maps 4. Australia 5. New Zealand 6. Sub-Antarctica.**

**4D–274** 551.509.2

New Zealand. Meteorological Office, **Daily weather bulletin.** Wellington, May **1944–to date.** Title varies. **DWB**—Monthly publication in which daily reports are listed in the respective international codes. From 1944–Aug. 1947, issued in two series: Sheet A, "Selected New Zealand weather reports;" Sheet B, "Aircraft weather reports." Sept. 1947—combined and issued as "Daily weather bulletin." Contents: Pt. 1. Synoptic observations; Pt. 2. Selected upper wind observations; Pt. 3. Upper air soundings; Pt. 4. Ship reports; Pt. 5. Aircraft weather reports. *Subject Headings:* **1. Observational data 2. Synoptic reports 3. Daily weather bulletins 4. New Zealand.**

**4D–275** 551.506.1:931

*New Zealand. Meteorological Office, **Climatological table, summary of records of temperature, rainfall, and sunshine. 1929–to date.** Reprints from: *New Zealand Gazette.* **DWB**—Standard monthly temperature and rainfall data, including difference from normal, given for 130 New Zealand stations (elevation up to 2930 ft), and sunshine brightness for 44 stations. Less extensive data for preceding years, dating back to 1904(?), may be found in earlier editions of the *New Zealand Gazette. Subject Headings:* **1. Monthly climatic data 2. New Zealand.**—*K.M.*

**4D–276** 551.5 551.582(94)

**Weather Development and Research Bulletin.** Melbourne, **1945–to 1952.** (Nos. 1–5 were issued by R.A.A.F. Meteorological Services.) **DWB**—Issues contain various articles on Australian meteorological research some very brief, such as notes on hail, thunderstorms, cloud occurrences, etc.; some on general meteorological subjects not necessarily applicable to Australia; some most significant which are abstracted separately; and some others worthy of note listed by *Bulletin* No. as follows:

No. 3, Nov. 1946. Loewe, F., "Frontal hours at Melbourne," p. 13–19.

No. 5, April 1946. Mackey, G. W., "Note on the behaviour of a cold front in the lee of a mountain range," p. 5–8. (Example cited occurred in Tasmania.) Loewe, F., "An exceptional pressure variation," p. 9–16 (barographs and synoptic situation given for occurrence at Melbourne, Jan. 1943).

No. 6, July 1946. Loewe, F., "A remarkable pressure variation," p. 5–14 (occurrence at Melbourne, April 1942, associated with passage of squall line). Mackey, G. W. and Dale, P. T., "Zonal indices—notes on their use in Tasmania," p. 15–20, charts.

No. 7, Dec. 1946. Ashton, H. T., "Principles of forecasting over equatorial areas to the north of Australia, embracing mainly those bounded by lat. 5° N. to 10° S. and long. 110°–150° E.," p. 5–40 (air masses, air streams and fronts pressure and winds, winds and fronts, movements of fronts, etc. discussed). Everist, S. L., "Isentropic charts—preliminary note on their use in Australian forecasting," p. 41–48 (data, vertical cross sections and isentropic charts included). Mackey, G. W and Dale, P. T., "The effect of variation in freezing level on rainfall in Tasmania," p. 50–56.

No. 8, July 1947. Vollprecht, R., "The cold mirage at Port Hedland," p. 15–22. Newman, B. W., "Phenomenal hail storm with thunderstorm at Sydney, 1st Jan. 1947," p. 23–37.

No. 9, Oct. 1947. "Report on the meteorological aspects of the Southern Ocean reconnaissance flights by the R.A.A.F. on March 12–15, 1947," p. 3–42 (containing tables and analytical charts). Newman, B. W. and Mackey, G. W., "A preliminary investigation into the use of easterly and westerly pressure indices in forecasting rain over north-west New South Wales," p. 43–55.

No. 10, June 1948. Hounam, C. E., "A measurement of drought," p. 5–14 (examples in Australia cited). Treloar, H. M., "Extreme winds in high levels," p. 15–18. Clarke, R. H., "Descriptive note on very fast-moving cirrus cloud observed at Canberra on 9–9–47 and 29–9–47," p. 19–20.

*Subject Headings:* **1. Periodicals 2. Fronts 3. Atmospheric pressure 4. Weather forecastin 5. Cloud physics 6. Hail 7. Thunderstorms 8. Precipitation forecasting 9. Drought 10. Uppe air winds 11. Cirrus cloud 12. Australia. I. Australia. R.A.A.F. Meteorological Service II. Loewe, F. III. Mackey, G. W. IV. Dale, P. T. V. Ashton, H. T. VI. Everist, S. L. VII. Voll precht, R. VIII. Newman, B. W. IX. Hounam, C. E. X. Treloar, H. M. XI. Clarke, R. H.**

## SUPPLEMENTARY MATERIAL

**4D–277** 551.579.

*Nimmo, W. H. R., **Storage of water and irrigation with particular reference to tropical seasona rainfall.** *Australian and New Zealand Association for the Advancement of Science, Congress, Brisbane May 1951, Papers*, Appendix C, **1951.** 15 p. 6 figs., 4 tables, refs. **DWB**—Pt. I, "Conservation," deals with the effect of temperature on the yield of catchments and presents data of annual tem perature, precipitation, runoff and water loss for 37 catchment areas in East Australia and Tasmania A graph shows relations of potential and actual evapotranspiration to annual temperature and give the limit between continuous and intermediate runoff. Graphical data for seasonal rainfall dis tribution presented. Pt. II, "Irrigation" deals with the annual course of evapotranspiration fo the Burdekin River project. Since THORNTHWAITE's method takes no account of humidity, it wa modified using also pan evaporation data. *Subject Headings:* **1. Hydrologic cycle 2. Evapotrans piration 3. Thornthwaite's method 4. Eastern Australia 5. Tasmania 6. Burdekin River Australia.**—*A.A.*

**4D–278** 551.5:621.384

Australia. Commonwealth Scientific and Industrial Research Organization, **Research activities of the Radiophysics Laboratory.** Aug. **1952.** 36 p. illus., diagr., refs. **DWB**—Current work of the Radiophysics Laboratory situated on the grounds of Sydney University is reported in this booklet, with numerous illustrations showing equipment, diagrams of instrument circuits and obtained measurements, and astronomic, ionospheric and cloud photographs. The fields surveyed in this report are solar radio spectroscopy, measurement of galactic radio noise and discrete sources of cosmic noise, radiospectroscopy of interstellar hydrogen, ionospheric measurement, radio investigation of rain and clouds, electronic computation and development of radio aid to navigation. Papers published elsewhere on these subjects by workers of the Laboratory are listed. *Subject Headings:* **1. Radiophysics research 2. Radiophysics Laboratory, Sydney, Australia.**—*G.T.*

**4D–279** 551.521.64

Burbury, D. W. P. and McLaren, A. C., **Cosmic ray asymmetry studies at Hobart, Tasmania.** *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 5(4):782–784, Dec. **1952.** 2 tables, 7 refs. **MH-BH**—Results of east-west measurements gave the asymmetry of $0.0195 \pm 0.0010$; north-south asymmetry was $0.0056 \pm 0.0013$. Correlations with barometric pressure height of an isobaric layer and the mean temperature over a region above the layer did not give significant results. *Subject Headings:* **1. Cosmic ray asymmetry 2. Hobart, Tasmania.**—*A.A.*

**4D–280** 551.583.2:551.311.12

Harrington, H. J., **Glacier wasting and retreat in the Southern Alps of New Zealand.** *Journal of Glaciology*, 2(12):140–145, Nov. **1952.** 2 figs., 29 refs. English and German summaries p. 140–141. **DWB**—It is considered that snow line began to rise in Rangitata area about 1866 and rise extended southwards to all Southern Alps by 1913. Ends of glaciers have retreated since 1866 by downwasting. Retreat has been continued for about 200 years with temporary interruptions. Retreat associated with decreased precipitation since 1863 and a southward shift of the South Polar front indicated by change of wind from SW to W. (*Same item as* 4.3–253, March 1953, *MAB.*) *Subject Headings:* **1. Historical climates 2. Glaciers 3. New Zealand.**—*C.E.P.B.*

**4D–281** 551.5(05)

New Zealand. Meteorological Office, **Technical Notes.** First issue received, No. 60, Aug. **1951**; last issue received, No. 97, Feb. 25, **1953. DWB**—Title varies: Nos. 1–80 issued as *Circular Notes;* beginning with No. 81, issued as *Technical Notes.* A list of authors and titles of Nos. 60–97 in the Series will be run in Pt. III, July 1953, *MAB. Subject Headings:* **1. Meteorological monograph series 2. New Zealand.**

# PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

**Note:** The contents of periodicals included in this section, are for information only, and will not be listed in the monthly indexes. When material is furnished in advance of date of publication, the pagination may be omitted.

**kademiia Nauk SSSR, Izvestiia, Seriia Geofizicheskaia,** Number 6, 1952.

**XIX S'ezd Kommunisticheskoĭ Partii Sovetskogo Soiuza i zadachi geofizicheskikh nauk,** [19th Conference of the Communist Party of the U.S.S.R. and problems in geophysical sciences], p. 3–6.

Kalashnikov, A. G.: **Magnitnyĭ effekt meteorov,** [Magnetic effect of meteors], p. 7–21.

Epinat'eva, A. M.: **O nekotorykh seĭsmicheskikh volnakh s bol'shimi vremenami prikhoda,** [Some seismic waves with large time lag], p. 21–38.

Kosminskaia, I. P.: **Amplitudnye krivye i godografy faz seĭsmicheskikh voln, vyzvannykh tochechnym istochnikom rasshireniia v odnorodnom ideal'no-uprugom bezgranichnom prostranstve,** [Amplitude curves and hodograph phases of seismic waves caused by point source of distribution in a homogeneous ideally-elastic infinite area], p. 39–47.

Veĭtsman, P. S.: **O podbore rastoianiĭ mezhdu seĭsmografami pri gruppirovanii s tsel'iu umen'sheniia fona pomekh,** [Selection of distances between seismographs in grouping in order to decrease background disturbances], p. 48–54.

Gorelik, A. M.: **Opredelenie napravleniia techeniia podzemnykh vod po nabliudeniiam elektricheskogo polia fil'tratsii,** [Determination of direction of flow of ground waters by means of observation with an electric filtration field], p. 55–56.

SHtokman, V. B.: **Opredelenie ustanovivshikhsia techeniĭ i raspredeleniia plotnosti v sredinnom poperechnom sechenii zamknutogo moria udlinėnnoĭ formy,** [Determination of established flow and distribution of density in a mean cross section of a closed sea with elongated form], p. 57–72.

SHishkin, N. S.: **Issledovanie rosta sfericheskogo grada,** [Investigation of the growth of spherical hail], p. 73–78.

Muchnik, V. M.: **Vliianie elektricheskogo polia na protsessy elektrizatsii v grozovykh oblakakh,** [Influence of electric fluid on the process of electrification in thunderclouds], p. 79–82.

IAroslavtsev, I. N.: **Rezul'taty aktinometricheskikh izmereniĭ vo vremia solnechnogo zatmeniia 25 fevralia 1952 g. v Tashkente,** [Results of aktinometric measurements during the solar eclipse February 25, 1952 in Tashkent], p. 83–87.

Hkhaidze, SH. M.: **K voprosu o privedenii koeffitsientov prozrachnosti atmosfery k edinichnoĭ masse,** [The problem of reducing coefficients of atmospheric transmission to a uniform mass], p. 88–90.

**laskan Science Conference, Washington, D. C., November 1950. Science in Alaska: Selected Papers. Arctic Institute of America,** June 1952.

Field, William O., Jr.: **Glaciological research in Alaska,** p. 123–135.

Waananen, Arvi O.: **The hydrology of Alaska,** p. 151–162.

Knapp, David G. and Roberts, Elliott B.: **Geomagnetism—cosmic and prosaic,** p. 163–169.

Bensin, Basil M.: **Agro-climatological investigations in the permafrost region of the Tanana Valley, Alaska,** p. 197–218.

**merican Geophysical Union, Transactions,** Volume 34, Number 1, February 1953.

Aslakson, Carl I.: **Relative geoidal undulations from deflections of the vertical,** p. 1–10.

Heiskanen, W.: **The geophysical applications of gravity anomalies,** p. 11–15.

Manning, L. A., Villard, O. G., Jr. and Peterson, A. M.: **Terrestrial magnetism and electricity, the length of ionized meteor trails,** p. 16–21.

Vehrencamp, John E.: **Experimental investigation of heat transfer at an air-earth interface,** p. 22–30.

Stidd, C. K.: **Cube-root-normal precipitation distributions,** p. 31–35.

Shapiro, A. and Simpson, L. S.: **The effect of a broken icefield on water waves,** p. 36–42.

Keller, Joseph B. and Goldstein, Edward: **Water wave reflection due to surface tension and floating ice,** p. 43–48.
Sanderson, Earl E. and Johnstone, Don O.: **Accuracy of determination of annual precipitation over a given area,** p. 49–55.
Banks, Harvey O. and Lawrence, Jack H.: **Water quality problems in California,** p. 58–66.
Potter, W. D.: **Rainfall and topographic factors that affect runoff,** p. 67–73.
Nelson, W. B. and Thomas, H. E.: **Pumping from wells on the floor of the Sevier Desert Utah,** p. 74–84.
Cook, Howard L. and Parsons, Donald A.: **Characteristics of tipping-bucket devices,** p. 85–94
Ewing, Maurice and Press, Frank: **Further study of atmospheric pressure fluctuations recorded on seismographs,** p. 95–100.
Maxwell, John C. and Verrall, Peter: **Expansion and increase in permeability of carbonate rocks on heating,** p. 101–106.
Bullen, K. E.: **On strain energy and strength in the earth's upper mantle,** p. 107–109.
Werenskloid, W.: **Faults and volcanoes,** p. 110.
Kellogg, W. W. and others: **Report of the standing committee on problems of the upper atmosphere, 1951–1952,** p. 115–121.
Lyman, John: **Oceanographic activities of the hydrographic offivr, 1946–1952,** p. 122–124.
Garstka, Walter U. and others: **Report of the committee on snow, 1950–1951,** p. 125–132.
Ackermann, W. C. and others: **Report of the research committee on precipitation, 1951–1952** p. 133.
Krick, I. P. and Smith, T. B.: **Some evaluations of sustained cloud-seeding operations,** p. 137–140.

**American Meteorological Society, Bulletin,** Volume 34, Number 1, January 1953.

Brunk, Ivan W.: **Squall lines,** p. 1–9.
Jenista, C. O., Jr.: **A statistical study of precipitation distribution as related to various types of mean zonal motion,** p. 10–13.
Appleman, H.: **The formation of exhaust condensation trails by jet aircraft,** p. 14–20.
Stout, G. E. and Neill, J. C.: **Utility of radar in measuring areal rainfall,** p. 21–27.
Woodbridge, David D. and Decker, Fred W.: **Weather-typing applied to summer frontal-rains in Oregon,** p. 28–37.
Hewson, E. W., Barad, M., Gosline, C. A., Neiburger, M., Wanta, R. C. and Willett, H. C.: **A statement on the present possibilities of applying meteorology in air-pollution,** p. 38–40.

**American Meteorological Society, Bulletin,** Volume 34, Number 2, February 1953.

McTaggart-Cowan, P. D.: **The Canadian experiment,** p. 51.
Bradbury, Dorothy L. and Palmen, E.: **On the existence of a polar-front zone at the 500-mb level,** p. 56.
Gringorten, Irving I.: **An objective system for estimating fog and stratus probability at Randolph Field, Texas,** p. 63.
**The New York meeting, January 26–29, 1953,** p. 62.
**Program of the 122nd national meeting, American Meteorological Society, Washington, D. C., April 29–May 4, 1953,** p. 78.

**Annalen der Meteorologie,** Volume 5, Number 6, 1952.

Müller-Annen, Hans: **Zur Prognose der Zugbahnen von Tiefdruckgebieten. Teil 2: Zugbahnen der Druckänderungsgebiete und synoptische Erklärungen,** [On forecasting tracks of depressions. Pt. 2. Isallobaric tracks and synoptic explanations], p. 161–168.
van Miegham, Jacques: **Grossräumige Energieumsetzungen in der Atmosphäre,** [Large-scale energy transformations in the atmosphere], p. 169–174.
Herbst, Walter: **Radioaktive Isotope in der meteorologischen und angewandtmeteorologischen Forschung,** [Radioactive isotopes in meteorological and applied meteorological investigation], p. 175–184.
Krügler, Fritz: **Über extrem starke örtliche Schwankungen der Wasseroberflächentemperatur in Eisnähe am Rande des Ostgrönlandstroms. (Kurzbericht über maritim-meteorologische Beobachtungen in der Dänemarkstrasse),** [On extreme local variations of sea surface temperature near the ice on the edge of the East Greenland current. (Summary of maritime meteorological observations in Denmark Strait)], p. 185–188.
Kohlbach, Walter: **Ungewöhnlicher Schneefall im mittleren Niedersachsen am 3.3.194,** [Unusual snowfall in central Lower Saxony, March 3, 1949], p. 189–190.
Schulz, Leo: **Über die Schneedecke im Oberharz,** [On the snow cover in upper Harz], p. 190–191.

**Annales de Géophysique,** Volume 8, Number 4, October/December 1952.

Sourdillon, Marc: **Étude à la chambre de Boys de "l'éclair dans l'air" et du "coup de foudre à cime horizontale,"** [Study of lightning from cloud to air and horizontal strokes to ground by means of the Boys camera], p. 349–354.

Millman, George H., **A study of ionospheric winds and turbulence utilizing long radio waves,** p. 365–384.

Malan, D. J.: **Les décharges dans l'air et la charge inférieure positive d'un nuage orageux,** [Atmospheric discharges and the positive charge in the base of a thundercloud], p.385–401.

Matchinski, Matthias: **Systèmes de tourbillons sujets à certaines conditions de minima. Application à la formation des rides éoliennes, des dunes, etc.,** [Systems of vortices subject to certain minimum conditions. Application to the formation of wind ripples, dunes, etc.], p. 402–442.

Grandmontagne, R.: **Remarques sur le calcul des températures de l'atmosphère,** [Notes on the calculation of atmospheric temperature], p. 443–446.

**Archiv für Meteorologie, Geophysik und Bioklimatologie,** Ser. A, Volume 5, Number 4, 1953.

Toperczer, M.: **Zur Definition der Seismizität,** [On the definition of seismicity], p. 377–385.

Schaffhauser, J.: **Untersuchungen über Quelle und Ausbreitung der atmosphärischen Unruhe,** [Investigation of the source and propagation of atmospheric turbulence], p. 386–410.

Schwarzl, S.: **Die interdiurne Veränderlichkeit von Druck und Temperatur in Troposphäre und Stratosphäre,** [The interdiurnal pressure and temperature variation in the troposphere and stratosphere], p. 411–431.

Frey, K.: **Die Entwicklung des Süd- und des Nordföhns,** [The development of the south and north föhn], p. 432–477.

Mayer, R.: **Zur statistischen Mechanik der Lufthülle der Erde,** [Statistical mechanics of the earth's atmosphere], p. 478–489.

**Arkiv för Geofysik,** [Stockholm], Volume 1, Number 14–21, 1953.

Aurén, T. E.: **Studies of solar radiation,** p. 395–439.

Lönqvist, O.: **Calculating effective radiation with due regard to its diffuse nature,** p. 441–451.

Norinder, H. and Siksna, R.: **Ionic density of the atmospheric air near the ground during thunder-storm conditions,** p. 453–472.

Molin, K.: **Movement of isoporic zero-lines for horizontal magnetic intensity in Sweden,** p. 473–482.

Siksna, R.: **Measurements of large ions in the atmospheric air at Uppsala,** p. 483–518.

Norinder, H. and Siksna, R.: **Variations of the concentration of ions at different heights near the ground during quiet summer nights at Uppsala,** p. 519–541.

Norinder, H.: **Variations of the electric field in the vicinity of lightning discharges,** p. 543–570.

Norinder, H., Metnieks, A. and Siksna, R.: **Radon content of the air in the soil at Uppsala,** p. 571–580.

**Geofisica e Meteorologia, Bollettino della Societa Italiana di Geofisica e Meteorologia,** [Genoa], Volume 2, Number 1, January/February 1953.

Ranzi, Ivo: **Una spedizione all'Antartide Occidentale per lo studio della ionosfera,** [An expedition to the West Antarctic to study the ionosphere], p. 3–4.

Sciarra Mortola, Luisa: **La microfisica delle nubi ed il controllo artificiale delle precipitazioni,** [Microphysics of the clouds and the artificial control of precipitation], p. 6–8.

Israël, Hans: **Rapporti fra i fenomeni elettrici e meteorologici nell'atmosfera,** [Relationships between electric and meteorological phenomena of the atmosphere], p. 9–14.

**II Secondo Convegno Internazionale di Meteorologia Alpina,** [The Second International Meeting of Alpine Meteorology], p. 14–15.

Bossolasco, Mario: **Forze endogene, metano e terremoti,** [Endogenous force, methane and earthquakes], p. 15–17.

Piccardi, Giorgio: **A proposito di una relazione fra fenomeni ambientali e fenomeni chimico-fisici: effetto della schermatura dello spazio,** [Relation of atmospheric phenomena and chemico-physical phenomena: the effect of shielding of an enclosure], p. 18–19.

**Ia Assemblea della Società Italiana di Geofisica Meteorologia, Genova: 10–11 Aprile 1953,** [The first General Assembly of the Italian Society of Geophysics and Meteorology, Genoa, April 10–11, 1953], p. 19.

**L'indagine dei fenomeni atmosferici a mezzo del radar,** [Investigation of atmospheric phenomena by means of radar], p. 20–22, 1953.

**L'utilizzazione dell'energia solare,** [Utilization of solar energy], p. 22–23.

**Germany. Deutscher Wetterdienst in der US-Zone, Berichte,** Number 42, 1952.

Schmauss, A.: **Sinoptik-Klimatologie,** [Synoptic climatology], p. 1–2.

Conrad, V.: **Temperature, wind direction and speed in the tropics,** p. 3.

Albrecht, F.: **Strahlungs- und Wärmehaushaltsuntersuchungen während einer Seereise durch den Indischen Ozean im Juni 1949,** [Radiation and heat economy investigations during a sea voyage across the Indian Ocean in June 1949], p. 5–10.

Loewe, F., Radok, U. and Grant, Alison: **Eine säkulare Klimaänderung im südlichen Indischen Ozean,** [A secular change of climate in the southern Indian Ocean], p. 11–15.

Keil, Karl: **Die Wetterdienstbibliothek im Laufe eines Jahrhunderts,** [The Weather Service Library in the past 100 years], p. 16–17.

Grober, J.: **Grundfragen der tropischen Bioklimatik,** [Fundamental problems of tropical bioclimatology], p. 17–20.

Leistner, W.: **Der tägliche Gang der langwelligen und mittelwelligen Ultravioletstrahlung in Abhängigkeit von der Bewölkung in Wyk auf Föhr,** [The diurnal variation of long and medium-wave UV radiation in relation to cloudiness at Wyk on Föhr], p. 20–23.

Zimmermann, Gerhard: **Andauer und Tagesgang der Schwüle nach stündlichen Auswertungen in Potsdam,** [Duration and diurnal variation of sultriness from hourly evaluations in Potsdam], p. 23–27.

Schubach, K.: **Lufttemperatur und Luftfeuchtigkeits-Untersuchungen im Gewächshaus, ein Beitrag zum Gewächshausklima,** [Air temperature and humidity investigations in the greenhouse, a contribution to the greenhouse climate], p. 27–30.

Grunow, J.: **Nebelniederschlag. Bedeutung und Erfassung einer Zusatzkomponente des Niederschlags,** [Fog rain. Meaning and estimation of a supplement to precipitation], p. 30–34.

Dinkelacker, O. and Beyerlein, F.: **Das Klima von Esslingen und Umgebung,** [The climate of Esslingen and district], p. 34–41.

Brose, K.: **Der warme Sommer 1952 in der 74 jährigen Beobachtungsreihe von Bamberg,** [The warm summer of 1952 in the 74-year series of observation at Bamberg], p. 41–46.

Schlegel, M.: **Die Böigkeit der Winde an einer Alpenvorlandstation unter Berücksichtigung des Föhns,** [Gustiness at an Alpine foothill station under influence of the föhn], p. 42–47.

Aniol, Rudolf: **Eine Statistik stärkerer Temperaturrückgänge im Sommer,** [Statistics of sharp temperature falls in summer], p. 50–53.

Schirmer, H.: **Über die Reduktion von kürzeren Niederschlagsreihen,** [On the reduction of short rainfall records], p. 54–57.

Hommel, K.: **Der Anschluss der alten Hohenpeissenberger Beobachtunsreihe an die Messungen bei der neuen Aufstellung auf Grund zweijähriger Vergleichsablesungen,** [The reduction of the old Hohenpeissenberg records to those at the new site by two years comparison], p. 57–62.

Israël, H.: **Gewitterbeobachtungen in Südwestdeutschland,** [Thunderstorm observations in SW Germany], p. 63–66.

Hofmann, G.: **Strahlungsfehler bei Haarhygrometern,** [Radiation errors in hair hygrometers], p. 66–67.

Debor, H. W.: **Obstbaupraxis und Kleinklima,** [Fruit culture practice and microclimate], p. 68–69.

Baumgartner, A.: **Zur Phänologie von Laubhölzern und ihre Anwendung bei lokalklimatischen Untersuchungen,** [On the phenology of deciduous trees and its application in local climatic investigations], p. 69–73.

Antonik, B. and Branicki, O.: **Ergebnisse 50 jähriger Beobachtungen mit dem Wild'schen Evaporimeter in Potsdam,** [Results of 50 years' observations with the Wild evaporimeter in Potsdam], p. 73–77.

Huttary, J.: **Häufigkeit von trockenen und nassen Perioden in verschiedenen Klimaten,** [Frequency of dry and wet periods in different climates], p. 77–82.

Höhne, W.: **Kompensation des Strahlungsfehlers beim Thermoelement und beim Widerstandthermometer,** [Compensation for radiation error in thermo-element and resistance thermometer], p. 82–85.

Hinzpeter, H.: **Neue langjährige Reihe der Globalstrahlung in Potsdam,** [New long series of global radiation in Potsdam], p. 86–87.

Reiter, R.: **Luftelektrisch-synoptische Untersuchungen im Alpenraum,** [Synoptic atmospheric electric investigations in the Alpine region], p. 87–91.

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Mrose, H.: **Über die Entstehung nicht-anthropogener Kondensationskerne,** [On condensation nuclei not produced by men], p. 122–125.
Ungeneuer, H.: **Ein biometeorologisches Experiment,** [A biometeorological experiment], p. 125–128.
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